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DOCUMENTATION PAGE

Form Approved
OMB No 0704-0188

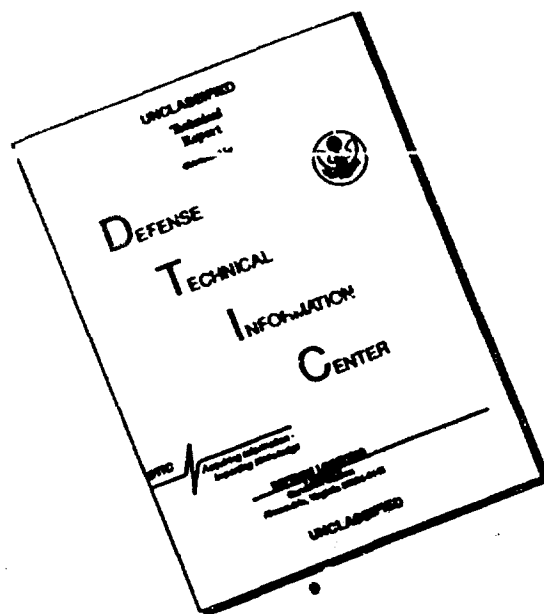
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2. REPORT DATE 12 Oct 90		3. REPORT TYPE AND DATES COVERED Documentation May - Oct 90	
4. TITLE AND SUBTITLE Technology Insertion (TI)/Industrial Process Improvement (IPI) Task Order No. 16 Data Base Documentation Book for MATPFA (UFC's) book 2 of 2		5. FUNDING NUMBERS Contract	
6. AUTHOR(S) McDonnell Douglas Missile Systems Company		8. PERFORMING ORGANIZATION REPORT NUMBER F33600-88-D-0567	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) McDonnell Douglas Missile Systems Company St. Louis, Missouri 63166		10. SPONSORING / MONITORING AGENCY REPORT NUMBER F33600-88-D-0567	
9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES) HQ AFLC/LGME WPAFB OH 45433		11. SUPPLEMENTARY NOTES Prepared in cooperation with SA-ALC & HQ AFLC	
12a. DISTRIBUTION / AVAILABILITY STATEMENT Distribution Statement A		12b. DISTRIBUTION CODE	
13. ABSTRACT (Maximum 200 words) Technology Insertion (TI)/Industrial Process Improvement (IPI) Data Base Documentation Book Volume, for SA-ALC/MATPFA (UFC's book 2 of 2). This document contains detailed information about layouts equipment and processes for this RCC. Also includes Simulation Modeling info for this RCC. 91 8 05 045			
14. SUBJECT TERMS Fuel Controls, Unified Fuel Control, AFLC		15. NUMBER OF PAGES 477	
17. SECURITY CLASSIFICATION OF REPORT Unclassified		18. SECURITY CLASSIFICATION OF THIS PAGE Unclassified	
19. SECURITY CLASSIFICATION OF ABSTRACT Unclassified		20. LIMITATION OF ABSTRACT Unclassified	

91-06874



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8.0
SIMULATION

MATPFA MODEL VALIDATION NOTES SUMMARY

TO 16

August 24, 1990



A-1

093951

INPUTS

WORK LOAD INFORMATION:

MATPFA performs OCM work on UFCs. The 3 main subcomponents of the UFCs were also modeled - Gas Generators [GG] , Distribution Bodies [DB] and Augmentor Computers [AC]. Distribution Bodies and Augmentor Computers before demating [AC/DB] were also modeled as a subcomponent. AC/DBs are the parent parts of ACs and DBs.

The work load is broken down into subcategories by the amount and type of work that needs to be done. The work load is broken down into three types:

"Super Quick Throughs" [F-15SQT and F-16SQT]- Basically they come in and are run through the SAT test. The UFC passes the test and is finished except for final packaging, paperwork, etc. This currently accounts for approximately <1% of the workload.

"Quick Throughs" [F-15QT and F-16QT]- These also require no or very little overhaul work. They run through tests such as an abbreviated augmentor set-in test, an M & I and an SAT. They pass these tests, or if they fail a part of the test, minor repair work can be done, while the part is still on the test stand, to correct the problem. This accounted for approximately 22% of the workload during the October/November 1989 time frame.

"Slow Throughs" [F-15ST and F-16ST]- These are items that fall-out of a test and may require overhaul and demating, extensive testing, etc. This accounts for remaining 78% of the workload. These items are the ones that produce the subassemblies of the gas generator, the augmentor computer and the distribution body.

The workloads for the F-15s and the F-16s have been adjusted to reflect these categories.

The overall quantities of UFCs inducted into the model was obtained from the G019C report plus the quantity inducted from engines for 4th quarter FY89 through 3rd quarter FY90. The inducted quantities by quarter are:

Q1	Q2	Q3	Q4
292	181	358	282

All UFCs recieved the same priority within the model.

RESOURCE INFORMATION

080002

Weekday staffing levels were derived from manpower staffing sheets provided by production for the period of May 16 to June 16 1990. Numbers were adjusted to represent those people shown on the staffing sheets but not contributing to "touch labor" [such as those with 11 and 12 codes from the Management Indicator report and the Code 11 shredout report]. The UFC area runs three shifts a day.

Weekend staffing levels were obtained from July 1990 staffing levels.

Manpower quantities and overtime have been fairly constant over the past year and the quantities used are considered representative.

Equipment quantities were provided by production plus physical counts were made in some areas.

Equipment downtime failure raw data was obtained from the G011 report and was reviewed and summarized to determine mean time between failures and mean time to repair.

The UFC area has 2 main areas -overhaul and test. The manpower is basically divided between the 2 areas with very little cross-over between the two due to certifications required to operate the various test stands. In the model, there is no sharing between the 2 areas.

In the test area, the manpower grades are fairly divided by what type of test stand they will operate. There are a couple of exceptions, but the supervisors on the floor try to avoid the exceptions. Manpower grades are associated with certain test stands in the model files.

In the overhaul area, all manpower grades will be approximated by a psuedo-grade called WG00. WG00 will do any overhaul work done. WG05s and WG07s can not perform some operations but the overhaul work is approximated by one operation that accounts for the overhaul manpower time needed.

An artifical code called WGSW was created from the WG00 code to model the personnel that perform the safety wire functions. WGSW have WG00s as alternates.

The test stands are located in 3 different physical areas but are not broken down by separate areas [areas B,D and bldg 347] within the model. When a test needs to be performed on a part, the part is sent to an area that has an available operator [Manpower is in short supply, not the equipment] so the test stands were kept as one group the avoid bias in resource utilization statistic reporting.

OPERATION INFORMATION

An overview of the flow of parts through the shop is shown in the diagram UFC Model Process Flow. Differentiation between UFCs was made to model the different amounts of repair/testing work required. Some require testing and little/no repair while others require testing and moderate to extensive repair work.

F-15 UFCs and F-16 UFCs were modeled separately because currently there is some variation in the process flow between the two - 100% of F-16s require demate while not all of the F-15s require demating.

The OCM aspect of the shop was modeled by occurrence factors on the "WCDs" and by cycling [repeating] some of the work. The occurrence factors were obtained from productions' October and November 1989 logbooks. Supervisors estimates were used when the data was not obtained from the log books.

Some of the operation resource times were taken from productions' October and November 1989 logbooks. These times were reviewed by production supervisors. The rest of the times were obtained from production supervisor estimates.

WCDs were created for the Super-Quick Throughs, Quick Throughs, and SlowThroughs.

The Super-Quick-Throughs [part names F-15SQT and F-16SQT] performed wcd SUPQTHRU.

The Quick-Throughs [part names F-15QT and F-16QT] performed wcd QUIKTHRU.

The F-15 Slow-Throughs [part name F-15ST] performed wcds SLOTHRU1, AWP-G, SLOTHRU0, SLOTHRU1, SLOTHRU2, and SLOTHRU3. The F-16 Slow-Throughs [part name F-16ST] performed wcds SLOTHRU1, AWP-G, SLOTHRU0, SLOTHRU1, and SLOTHRU3.

The AC/DB performs wcd SLOTHRU4 and is created in wcd SLOTHRU2.

The AC performs wcd SLOTHRU5 and is created in wcd SLOTHRU4 .

The DB performs wcd SLOTHRU6 and is created in wcd SLOTHRU5.

The F-15ST and the F-16ST disassembles and assembles the AC/DB in wcd SLOTHRU3. The AC/DB disassembles and assembles the AC which disassembles and assembles the DB.

It was indicated that the AC/DBs are not generally worked until the gas generators are finished being worked. Therefore the disassembly for the AC/DB did not occur until after the gas generator work was completed [wcd SLOTHRU2, operation 0600]. To make the AC/DB work in parallel with the gas generator, move the operation to before operation 0100.

MODEL OUTPUT SUMMARY

Historical Data Information - Actual flow times from January to June 1990 were used to calculate an average flowtime. The F-15 average is 129 days and the F-16 average is 123 days. The monthly average flow time has been decreasing with the June average about 90 days. Three main aspects make up the average flow times - the time spent in repair, the time spent awaiting parts and the time as work in process.

Awaiting parts average time was obtained from the April and May UFC production data. 27% of the parts waited an average of 171 total days AWP. This includes items that went into G condition. Items go into G condition when they are AWP greater than 90 days. 78% of the items that went AWP had greater than 90 days in AWP.

Work in process, in this case, represents those items that have been inducted but have their repair delayed, for reasons other than constrained resources or AWP, while other items get worked. The average time for this has been estimated at 60 days.

It should be noted that over the past 6 months production has increased, WIP has decreased [from about 4 months production to about 2 months] and flow days in the shop has decreased. For validation purposes, flowtimes and production comparisons will be made with the data from the same time frame that was modeled.

Output Information - The flowtime and throughput comparisons are shown on the following page. Three different runs were made and the flowtime and throughputs were averaged. The 3 runs are included.

Even though validation occurred over a specific 2 week period, outputs and inputs were examined over the course of the task order. Early model runs were made [starting 4 weeks into the task order] and the inputs/outputs were examined and reviewed. Detail was added after each model run. Approximately 5 major different runs were made, each with an increasing level of detail and correctness.

VALIDATION CRITERIA SUMMARY

MATPFA MODEL DATA COMPARISONS TO HISTORICAL DATA

UFC	Model Flow Time [days]				Historical Flow Time [days]	% Dev
	RUN #1	RUN #2	RUN #3	Average		
F-15	111	110	102	108	129	17%
F-16	116	119	114	116	123	5%

UFC	Model Inductions [units]				Historical Inductions [units]	% Dev
	RUN #1	RUN #2	RUN #3	Average		
F-15	504	513	499	505	524	4%
F-16	578	559	572	570	589	3%

F-15 and F-16 WORK LOAD DATA by CONTROL # by QUARTER

F-15	4th Qtr 89	1st Qtr 90	2nd Qtr 90	3rd Qtr 90
09767A	85	80	137	102
12600A	19	24	39	38

F-16

12572A	146	31	95	1
13509A	42	46	87	141

MANPOWER STAFFING LEVELS

THE FOLLOWING TABLE SHOWS THE RAW DATA USED TO CALCULATE
OVERTIME IN THE UFC AREA

1st Shift		1-Jul-90	7-Jul-90	8-Jul-90	14-Jul-90	21-Jul-90	22-Jul-90	28-Jul-90	29-Jul-90	Average
TEST										
50002	12	10	12	16	14	6	13	5	11	
50004	0	0	0	4	5	7	5	5	3	
50005	2	6	6	4	4	1	1	1	3	
50173	1	1	1	1	3	1	3	2	2	
OVERHAUL										
WG-10	6	4	5	13	11	7	10	7	8	
WG-09	1	2	2	2	1	1	1	0	1	
WG-07	3	4	3	5	6	4	5	4	4	
WG-05	0	0	1	1	0	0	1	0	0	
GS-09	0	1	1	0	1	1	1	1	1	

THE FOLLOWING TABLE SHOWS THE RAW DATA USED TO CALCULATE
OVERTIME IN THE UFC AREA

2nd Shift											Average
	1-Jul-90	7-Jul-90	8-Jul-90	14-Jul-90	21-Jul-90	22-Jul-90	28-Jul-90	29-Jul-90			
TEST	7	9	5	8	7	8	14	11		9	
50002											
50004	2	2	2	3	5	3	4	4		3	
50005	4	4	2	2	4	3	3	3		3	
50173	0	0	0	0	0	0	0	0		0	
OVERHAUL											
WG-10	12	9	9	8	13	11	11	11		11	
WG-09	0	2	2	2	1	1	2	2		2	
WG-07	1	2	2	2	2	2	2	2		2	
WG-05	0	0	0	0	0	0	1	1		0	
GS-09	0	1	1	0	1	1	1	1		1	

THE FOLLOWING TABLE SHOWS THE RAW DATA USED TO CALCULATE
OVERTIME IN THE UFC AREA

3rd Shift		1-Jul-90	7-Jul-90	8-Jul-90	14-Jul-90	21-Jul-90	22-Jul-90	28-Jul-90	29-Jul-90	Average
TEST										
50002	6	5	6	10	10	10	12	11	10	9
50004	2	1	2	1	1	1	1	3	3	2
50005	2	1	2	1	1	2	2	3	3	2
50173	1	0	1	0	0	1	1	1	1	1
OVERHAUL										
WG-10	4	2	4	4	4	4	5	4	5	4
WG-09	3	1	4	1	1	3	3	4	5	3
WG-07	1	0	0	2	2	0	0	0	0	0
WG-05	1	0	0	0	0	0	0	0	0	0
GS-09	1	1	0	0	0	0	0	1	1	1

OPERATION COMMENTS REPORT

Prints out comments for those operations that have them.

Thursday,
August 23,
1990

10:18:38

1

OPERATION

COMMENTS

AWP-G 0050 P

This WCD represents those parts that go into AWP. Since about 28% of all parts go AWP at some time, and only those that are identified as slothrus will go AWP [in the model], the occurrence factor on this WCD was adjusted up to take this into account.

This operation represents the delay before going AWP.

AWP-G 0100 P

This operation is for those parts that spend less than 90 days AWP and therefore will not be G condition.

AWP-G 0200 P

This operation is for those parts the went AWP and possibly G condition. They spent more than 90 days AWP.

QUIKTHRU 0000 P

We are assuming that once a crate arrives at Bldg 348, approximately 2 hours will pass before the UFC will be removed and the initial paperwork/inspection/testing will begin. Although it has been stated that there are instances where a UFC can wait in the staging area nearly 3 weeks before operations begin, we are assuming the 2-hour flow as the norm.

QUIKTHRU 0100 P

The constant incoming time for the paperwork/inspects/test operations was obtained from consulting shop personnel on the OCM line and tracker times. Since the operation procedures are fairly stable, a constant figure was used for the operation times.

QUIKTHRU 0200 S

The times given for the RAR plumbing were obtained from the Oct/Nov 89 Log book study . Times were reviewed with production supervisors and compared to the May log book.

QUIKTHRU 0300 P

As with RAR plumbing, the times are from the Oct-Nov logbook. Times were reviewed with production supervisors and compared to the May log book.

QUIKTHRU 0400 P

The ASI test times also come from the Oct-Nov logbook. Times were reviewed with production supervisors and compared to the May log book.

QUIKTHRU 0500 P

OPERATION COMMENTS REPORTThursday, August 23, 2
1990

Prints out comments for those operations that have them.

OPERATION**COMMENTS**

M&I TestAs with the other 50002 tests, the model times were obtained from the October-November logbook.

QUIKTHRU 0600 P

The SAT times were obtained in the same manner as the other 50002 tests and come from the Oct-Nov logbook. Times were reviewed with production supervisors and compared to the May log book.

QUIKTHRU 0700 P

The electrical check test is performed by a WG11 operator at the 50002 test stand. Time was formulated by shop estimates and tracker data.

QUIKTHRU 0800 P

Since shop supervisory personnel indicate that an equivalent of 2 overhaul personnel on first shift, 1 on second shift, and 1 on third shift are being utilized solely in the safety wire area, we created a separate manpower classification to properly reflect the overhaul situation.

QUIKTHRU 9999 P

The estimate that the UFC will typically wait in the safety wire area for transport for about 4 hours was obtained as an estimate from scheduling. The opinion was that DS personnel were generally good about moving the asset promptly.

SLOTHRU0 0300 P

Comments made about the ASI on the QUIKTHRU wcd are applicable here.

SLOTHRU0 0400 P

Comments made concerning the M&I on the QUIKTHRU wcd are applicable here.

SLOTHRU0 0500 P

Comments about the SAT test on the QUIKTHRU wcd are applicable here.

SLOTHRU1 0100 P

This time represents OCM line work which can be performed on external parts of a UFC without demating. The times were obtained from shop personnel and tracker data.

SLOTHRU1 0200 S

This time represents the plumbing time associated with a complete UFC. The time is the same as given for an RAR plumb. The same comments on the QUIKTHRU wcd are applicable.

SLOTHRU1 0300 P

050014

OPERATION COMMENTS REPORT

Thursday, August 23, 3
1990

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OPERATION

COMMENTS

The M&I comments on the QUICKTHRU wcd are applicable here.

SLOTHRU2 0100 P

The distribution times represented above were obtained through shop personnel discussions and tracker data analysis. Basically determined from a shop operator and tracker what task codes consisted of at least 80% of the work load and if any of these task codes had to be worked in conjunction with others. For example, if task 404 were worked, then task codes 405, 417, 419, and 441 required work also. I then determined a weighted average based upon a discrete distribution. From the significant task codes, I took the highest number in tracker and the lowest number to form the triangular distribution.

SLOTHRU2 0200 S

This time represents the gas generator 50004 set-up or plumb operations.

SLOTHRU2 0300 P

The distribution figures again came from the Oct-Nov logbook.

SLOTHRU2 0400 P

This operation represents the GG recycle work.

SLOTHRU2 0500 S

THIS IS SET -UP FOR THE 50004 STAND AFTER RECYCLE WORK.

SLOTHRU2 0550 P

GG recycle work - The comments written for operation 0300 apply here.

SLOTHRU3 0100 P

This operation represents the electrical checks done by the WG11 operator at the 50002 test stand.

SLOTHRU3 0200 P

THIS IS THE SAFETY WIRE AND OTHER FINAL OPERATIONS DONE BY OVERHAUL PERSONNEL IN THE SAFETY WIRE AREA. DISTRIBUTION TIMES WERE TAKEN FROM TRACKER DATA (TASK CODES 92 AND 93).

SLOTHRU3 9999 P

Mandatory outgoing flow time. The same comments from QUICKTHRU apply here.

SLOTHRU4 0100 P

OPERATION COMMENTS REPORTThursday, August 23, 4
1990

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OPERATION**COMMENTS**

This operation represents work on the AC/DB without demating. The times were figured on occurrences of task codes in tracker and from shop personnel information concerning what codes were worked for the AC/DB. The average was derived from a discrete distribution of the task codes while the min and max times were taken from the high times of worked task codes on tracker.

SLOTHRU4 0200 P

This represents the disassembly of the AC and DB. Times were determined from tracker and shop personnel.

SLOTHRU4 0300 P

This operation represents the remating of the AC to the DB. Times were again taken from shop personnel and tracker data.

SLOTHRU4 0400 S

This operation represents set-up time for the ASI test on a 50002 test stand. The times were obtained from both shop supervisory personnel and tracker data.

SLOTHRU4 0500 P

This operation represents test time for the ASI test on a 50002 test stand.

SLOTHRU4 0600 S

This operation represents the ASI set-up on a 50005 test stand. A WG10 operator was utilized on this stand.

SLOTHRU4 0700 P

This is the ASI on the 50005. The same comments as those on operation 0500 apply here.

SLOTHRU4 0800 P

This operation represents the AC/DB recycle work. The occurrence factor for the rework was determined from the tally sheet filled out by the OCM team.

SLOTHRU4 0900 S

THIS IS THE ASI RE-TEST FOR THE REWORKED PARTS ON THE 50002 TEST STAND.

SLOTHRU4 1000 P

THIS IS THE ASI RE-TEST FOR THE REWORKED PARTS ON THE 50002 TEST STAND.

SLOTHRU4 1100 S

THIS IS THE ASI FOR REWORKED PARTS ON THE 50005.

090016

OPERATION COMMENTS REPORT

Thursday, August 23, 5
1990

Prints out comments for those operations that have them.

OPERATION

COMMENTS

SLOTHRU4 1200 P

THIS IS THE ASI FOR REWORKED PARTS ON THE 50005.

SLOTHRU5 0100 P

Work AC

SLOTHRU5 0200 P

WORKAC

SLOTHRU5 0300 S

This operation represents the set-up time for the PLA bracket, a sub-component of the AC. The shop supervision estimates that every time repair work has to be done on an augmentor, the PLA bracket will need to be tested at least 75% of the time. The set-up times were obtained from shop supervision estimates .

SLOTHRU5 0400 P

This operation represents the PLA bracket test. The times again were taken from shop personnel and supervision estimates. The little tracker data which does exist is low and not representative.

SLOTHRU5 0500 P

In this operation, the PLA bracket is re-installed into the AC. The distribution represents tracker data and shop estimates.

SLOTHRU5 0600 S

This operation represents the set-up time for the AC test. The distribution was determined from shop supervision estimates.

SLOTHRU5 0700 P

This represents the AC test times. Times were taken from shop floor personnel.

SLOTHRU5 0800 P

The situation with the recycle occurrence factor is similar to that of the AC/DB rework.

SLOTHRU5 0900 S

This represents the set-up time for the AC recycle test.

SLOTHRU5 1000 P

The AC test times for the recycle.

080017

OPERATION COMMENTS REPORTThursday, August 23, 6
1990

Prints out comments for those operations that have them.

OPERATION**COMMENTS**

SLOTHRU5 1100 P

This represents the remated time for the AC and the DB. The times were obtained from the tracker codes.

SLOTHRU6 0100 P

This distribution represents work done on the distribution body. The data was tabulated from tracker data of DB codes.

SLOTHRU6 0200 S

This represents set-up time for the DB on the 50005 test stand. The times are shop floor estimates from supervision.

SLOTHRU6 0300 P

this represents the DB test time on the 50005 test stand. The distribution was determined from shop supervision estimates and tracker data.

SLOTHRU6 0400 P

Rework necessary on the DB. As with the AC recycle occurrence factor, the same issues apply here.

SLOTHRU6 0500 S

SET-UP FOR THE RE-TEST ON THE 50005 FOR THE DB.

SLOTHRU6 0600 P

This represents the actual rework test on the DB.

SLOTHRU7 0010 P

Represents the disassembly of the Gas Generator.

SLOTHRU7 0020 P

Represents the reassembly of the gas generator.

SLOTHRU7 0050 P

DEMATE AC/DB. THE TIME IS TAKEN FROM TRACKER DATA. Even though on the shop you cannot demate the gas generator without the AC, they are disassembled separately in the model in order to model the process flow.

SLOTHRU7 0100 P

REMATED TO THE AC/DB. THE TIME IS TAKEN FROM TRACKER DATA.

080018

OPERATION COMMENTS REPORTThursday, August 23, 7
1990

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OPERATION		COMMENTS
SLOTHRU7	0200	S

PLUMBING FOR THE M&I TEST. ANY COMMENTS PERTAINING TO PLUMBING TIMES FOR THE UFC ON A 50002 TEST STAND ARE APPLICABLE HERE. THIS INCLUDES SHOP SUPERVISION COMMENTS AND TIME ESTIMATES.

SLOTHRU7	0300	P
----------	------	---

M&I TEST.

SLOTHRU7	0400	P
----------	------	---

SAT TEST.

SLOTHRUI	0000	P
----------	------	---

Incoming delay time. Includes time for scheduling paperwork and routing delays.

SLOTHRUI	0100	P
----------	------	---

Incoming inspection.

SLOTHRUI	0200	S
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Any comments made for this operation in the QUIKTHRU wcd are equally applicable here. However, for each wcd being utilized in the model, there is an occurrence factor being attributed to it. The occurrence factor represents what percent of the time a UFC can be expected to be processed through this WCD. Occurrence factors were obtained through many resources - the ufc process flow diagram, shop personnel, OCM team, tracker data, and scheduling. Although each one of these sources may disagree to some extent, we attempted to determine a factor which would reasonable taking into account the differences.

SLOTHRUI	0300	P
----------	------	---

RAR - The same comments which were made regarding the QUIKTHRU wcd regarding the RAR are applicable here.

SUPQTHRU	0000	P
----------	------	---

The superquick throughs basically need an SAT test only, and then they are sold. This operation represents incoming delays

SUPQTHRU	0100	P
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INT & SAT INSP TEST

SUPQTHRU	0200	S
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PLUMB SAT

090019

OPERATION COMMENTS REPORTThursday, August 23, 8
1990

Prints out comments for those operations that have them.

OPERATION**COMMENTS**

SUPQTHRU 0300 P

SAT

SUPQTHRU 0350 P

THIS IS THE ELECTRICAL CHECK OPERATION DONE BY A WG11 OPERATOR AT THE 50002 TEST STAND.

SUPQTHRU 0400 P

THIS IS THE SAFETY WIRE,PW, AND PACK OPERATION DONE BY THE DEDICATED OVERHAUL OPERATORS.

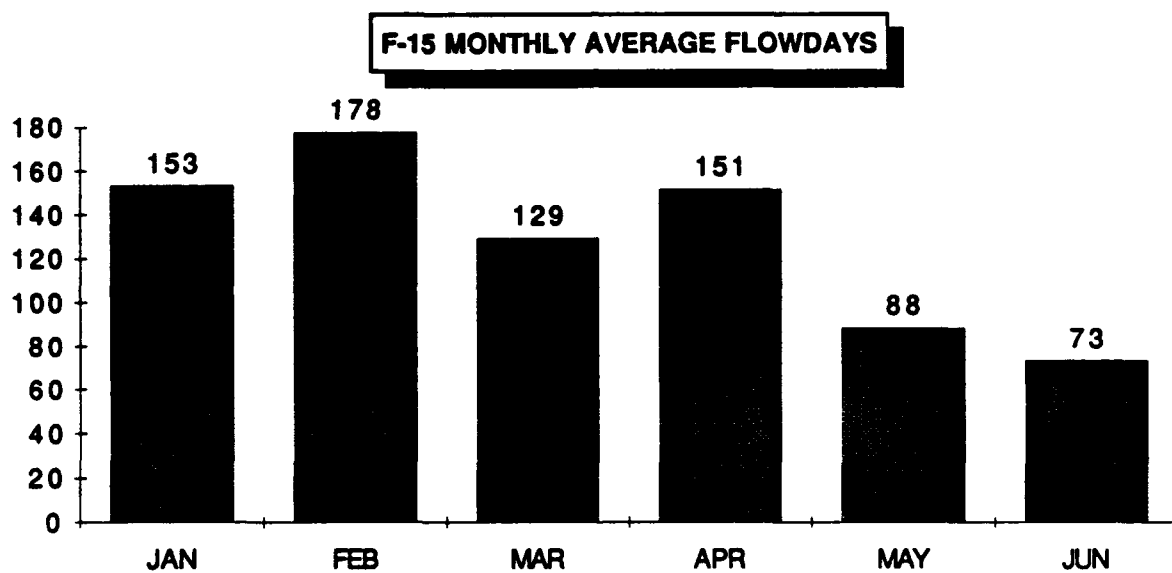
UFC F-15 RAW HISTORICAL FLOWTIME DATA

1-Jan-90	Feb-90	Mar-90	Apr-90	May-90	Jun-90
6	11	13	7	7	3
8	12	13	9	8	5
12	12	13	12	8	6
12	12	20	18	8	7
12	12	20	21	9	10
13	12	21	25	10	10
13	13	25	25	17	10
13	14	27	26	18	11
17	14	28	28	19	11
17	14	29	30	19	11
19	14	29	31	19	11
23	14	30	31	19	12
24	14	30	32	21	12
25	15	31	33	21	12
29	16	31	33	23	12
30	16	33	33	24	13
31	17	34	33	25	13
31	18	34	33	26	13
34	19	35	34	26	13
35	21	35	37	27	13
39	22	39	37	27	13
45	23	41	38	28	13
50	25	47	38	28	13
52	25	47	39	28	13
55	26	49	39	30	13
64	45	49	43	32	14
71	46	55	45	32	14
73	62	59	45	32	15
74	62	63	53	33	15
76	63	66	53	34	16
77	74	80	55	34	17
83	77	93	58	34	17
87	100	94	60	40	18
88	112	115	65	47	18
89	115	125	82	62	19
91	116	133	95	76	20
96	119	150	96	77	20
97	120	150	140	89	21
99	133	151	142	91	24
105	139	153	237	112	25
136	140	177	370	118	27
201	172	237	481	208	28
223	179	428	555	212	28
260	182	502	577	213	29

080031

UFC F-15 RAW HISTORICAL FLOWTIME DATA

1-Jan-90	Feb-90	Mar-90	Apr-90	May-90	Jun-90
315	217	544	593	218	32
364	237	648	618	260	34
399	237	671	669	266	38
428	241	693	677	289	38
460	252		879	321	42
525	380			427	43
563	386			637	45
577	442				54
643	540				54
690	558				56
805	565				63
71	568				69
	587				70
	635				88
	726				210
	840				294
	873				334
	259				510
					566
					608
					833



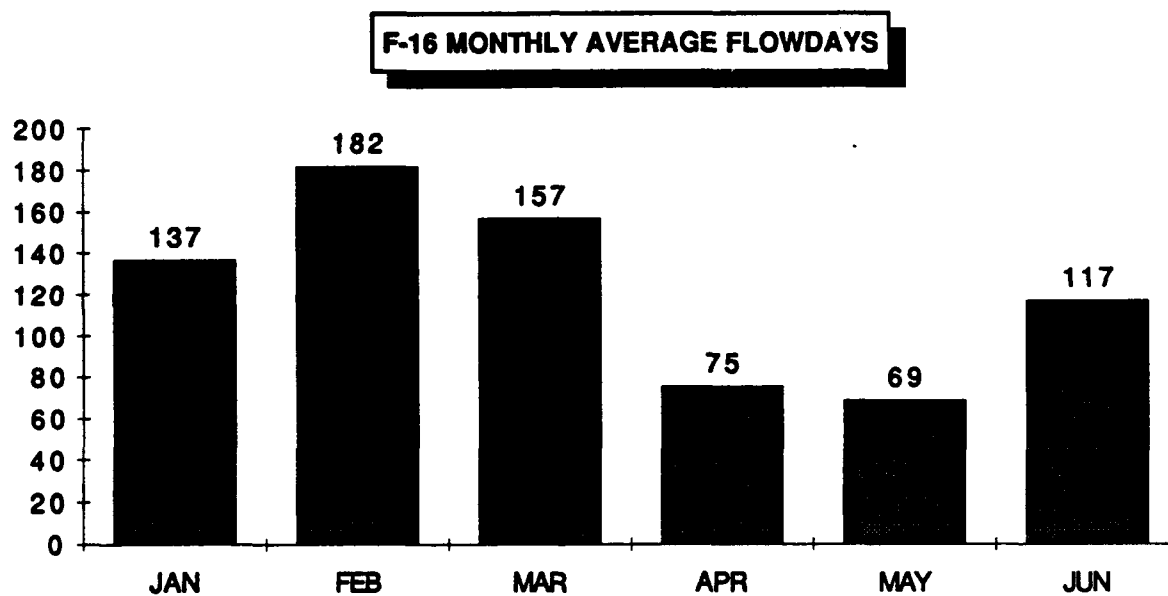
UFC F-16 RAW HISTORICAL FLOWTIME DATA

January 1990	Feb-90	Mar-90	Apr-90	May-90	Jun-90
6	9	20	12	15	24
10	20	27	12	24	27
12	35	32	13	27	47
12	37	33	14	28	48
12	38	34	15	28	54
16	39	35	19	33	55
17	40	35	19	34	55
20	44	41	29	35	55
21	45	42	31	36	58
21	50	42	33	36	61
24	51	46	33	40	61
41	55	46	33	40	63
41	57	48	34	40	63
42	64	53	34	42	64
52	80	54	35	43	66
61	81	61	35	45	69
69	84	65	36	45	70
69	86	66	38	45	70
70	103	68	38	45	72
72	108	72	40	46	76
76	115	73	40	46	80
79	144	76	41	46	90
81	145	77	41	48	90
83	154	85	41	48	90
83	154	86	41	48	94
88	160	90	42	48	101
91	161	94	43	52	104
98	172	97	44	52	111
101	173	106	45	57	113
102	174	114	45	59	147
106	188	119	47	59	188
111	218	127	48	59	217
112	300	135	48	60	217
118	355	137	50	64	222
127	381	140	51	65	230
155	383	144	54	67	254
161	384	145	54	68	263
166	424	147	54	69	269
167	441	156	54	70	314
174	442	192	54	70	322
241	444	192	57	73	
245	460	205	60	77	
255	735	208	61	88	
268	167	208	75	90	

080024

UFC F-16 RAW HISTORICAL FLOWTIME DATA

January 1990	Feb-90	Mar-90	Apr-90	May-90	Jun-90
344		220	84	139	
367		222	102	217	
378		230	154	221	
398		234	161	269	
406		237	175	305	
418		239	314		
679		267	385		
		290	412		
		338	458		
		353			
		449			
		483			
		504			
		509			
		587			



AWP FLOWDAYS RAW DATA FROM FEBRUARY AND MARCH 1990

Average:	172
Std Deviation	102

59	174
105	168
106	62
62	196
59	168
151	61
140	321
196	188
35	178
155	196
35	188
57	154
155	155
154	284
188	305
179	283
154	
164	
195	
155	
154	
375	
371	
197	
151	
436	
180	
154	
470	
478	
85	
66	
194	
62	
112	
41	
174	
100	
174	
62	
174	
174	

SUMMARY OF AWP DATA

August, 1990

Feb/Mar Data for those UFCs that had to await parts

Interval #	AWP Total Flowdays	Count
1	0-30	0
2	30-60	6
3	60-90	7
4	90-120	4
5	120-150	1
6	150-180	21
7	180-210	10
8	210-240	0
9	240-270	0
10	270-300	2
11	300-330	2
12	330-360	0
13	360-390	2
14	390-420	0
15	420-450	1
16	450-480	2
17	480-510	0
18	510-540	0
19	540-570	0
20	570-600	0

Total # AWP 58

Total # UFCs Sold 211

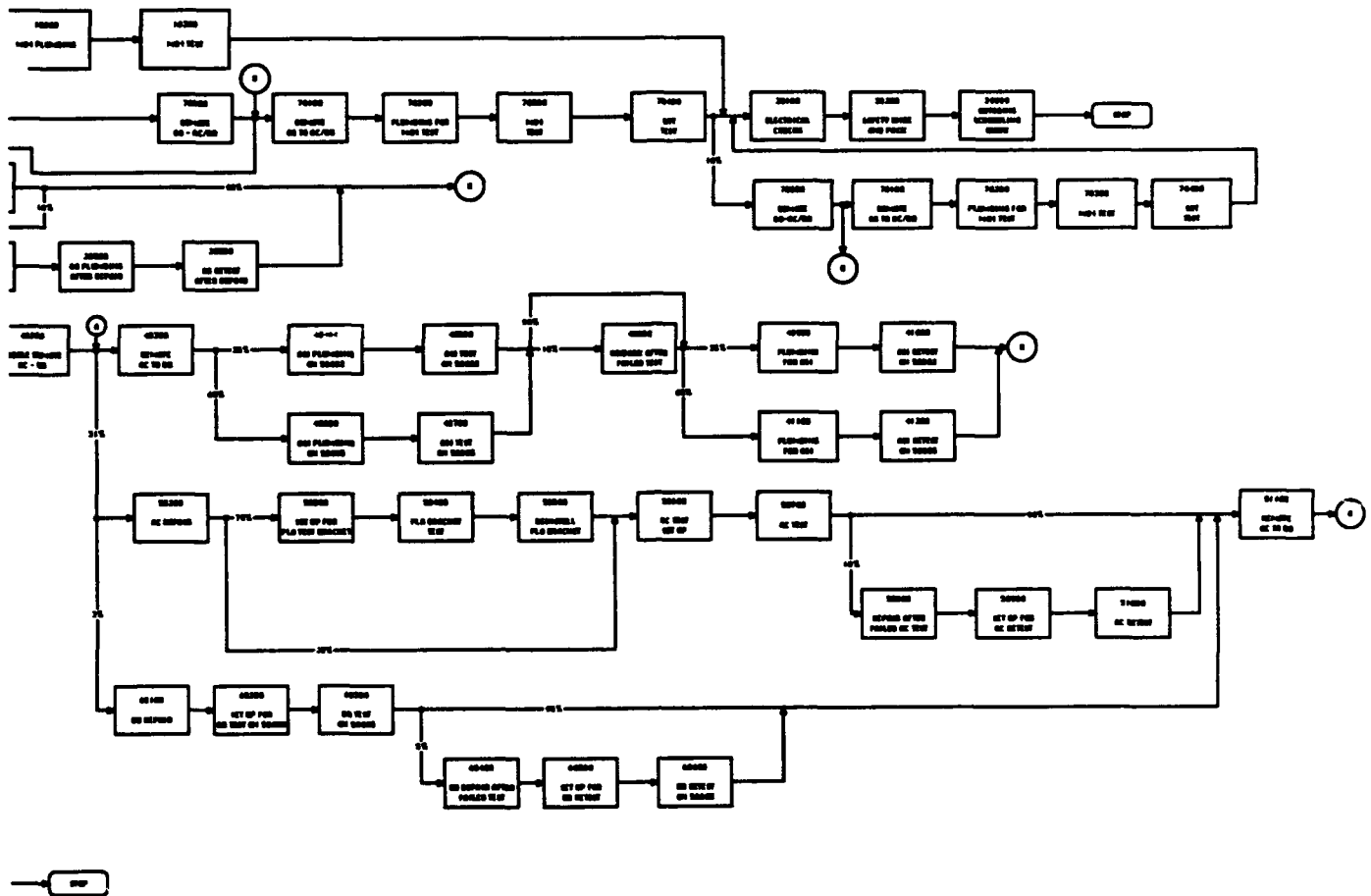
% UFCs that went AWP 27

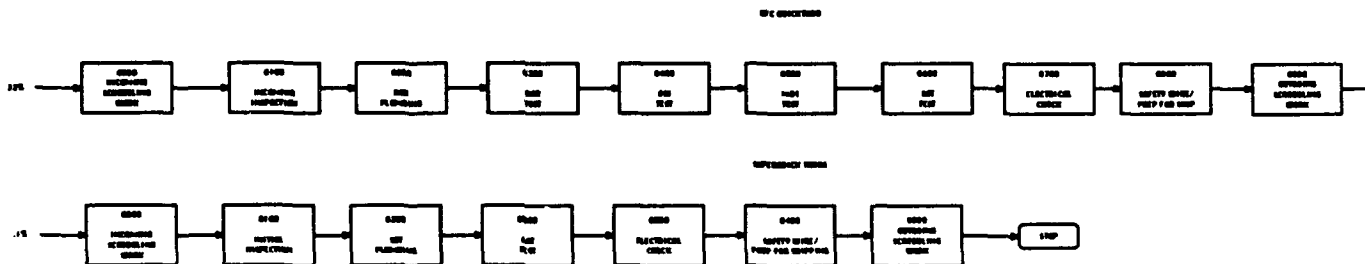
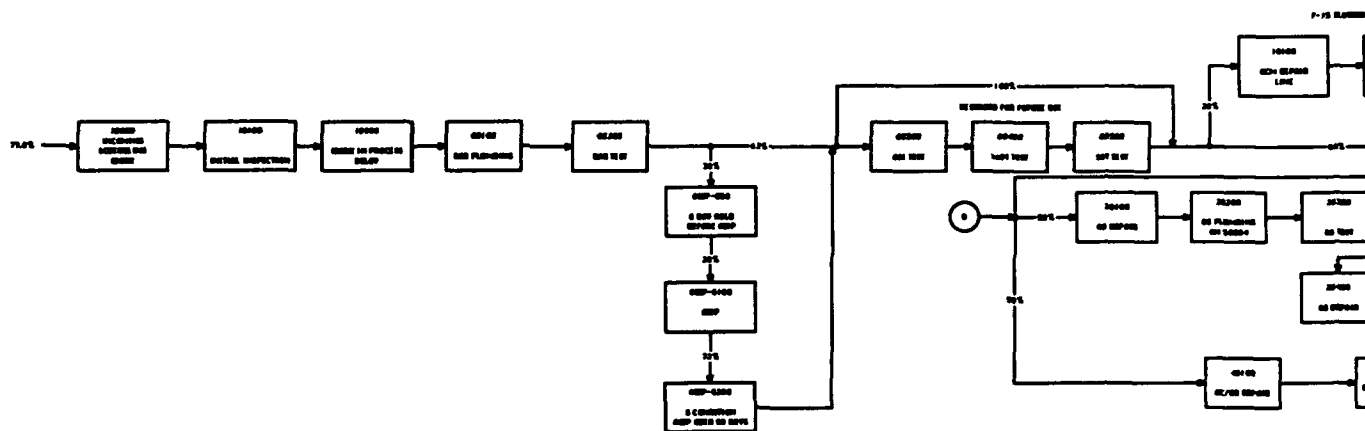
Ave Days AWP 172 4128

St Dev AWP 102 2448

080018

F-15 MODEL PROCESS FLOW





STOP
END OF PROGRAM
END OF PROGRAM

F-16 MODEL PROCESS FLOW

MODEL RUN #1

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 20-AUG-90 TIME: 15:25:12 REPT.ID: VALID PAGE: 1

RUN PARAMETERS

UDOS :
This job was run on SAALC, a little tiny vax.

ALC: SA

RCC: MATPFA

REPORT ID: VALID

UFC AREA - VALIDATION VERSION

PART FILE: UFC5PART.DAT
RES FILE: UFC5RES.DAT
OPER FILE: UFC5OPS.DAT
ETC FILE: UFC5ETC.DAT

WEEKENDS = Y

NUMBER OF QUARTERS = 4

WARM UP PERIOD: STATS WILL BE CLEARED AT DAY 270

OF HOLIDAYS 0

HISTORICAL DATA SHIFT FACTOR 8.000000

BACKSHOP DATA SHIFT FACTOR 24.000000

NEW DATA FORMATS SELECTED

SIMULATION CPU TIME: 27.00 MINUTES

SIMULATION LAPSE TIME: 28.20 MINUTES

SIMULATION RUN LENGTH: 15216.00 HOURS

Number of Items : 10

Number of Resources : 9

Number of WCDS : 21

Number of Operations : 76

Operations completed : 29786

ALC: SA RCC: MATPFA

QUARTER: 4 DATE: 20-AUG-90 TIME: 15:25:12 REPT.ID: VALID PAGE: 2

ITEM INDUCTIONS

	1ST QTR	2ND QTR	3RD QTR	4TH QTR	YTD	
INDUCTIONS OF ITEM AC	107	111	77	116	411	(MISTR)
INDUCTIONS OF ITEM AC/DB	231	237	166	249	883	(MISTR)
INDUCTIONS OF ITEM DB	107	111	77	116	411	(MISTR)
INDUCTIONS OF ITEM F-15QT	23	23	39	31	116	(MISTR)
INDUCTIONS OF ITEM F-15SQT	1	0	1	0	2	(MISTR)
INDUCTIONS OF ITEM F-15ST	80	81	136	109	406	(MISTR)
INDUCTIONS OF ITEM F-16QT	41	17	40	31	129	(MISTR)
INDUCTIONS OF ITEM F-16SQT	0	1	0	1	2	(MISTR)
INDUCTIONS OF ITEM F-16ST	147	59	142	110	458	(MISTR)
INDUCTIONS OF ITEM GG	236	232	166	252	886	(MISTR)

TOTAL ITEM INDUCTIONS

: 973 872 844 1015 3704

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 20-AUG-90 TIME: 15:25:12 REPT.ID: VALID PAGE: 3

WCD INDUCTIONS

	1ST QTR	2ND QTR	3RD QTR	4TH QTR	YTD	
INDUCTIONS OF WCD	33	41	26	36	136	
INDUCTIONS OF WCD	107	111	77	117	412	
INDUCTIONS OF WCD	5	6	3	1	15	
INDUCTIONS OF WCD	23	23	39	31	116	
INDUCTIONS OF WCD	1	0	1	0	2	
INDUCTIONS OF WCD	80	81	136	109	406	
INDUCTIONS OF WCD	36	37	30	49	152	
INDUCTIONS OF WCD	66	66	65	90	287	
INDUCTIONS OF WCD	16	16	17	24	73	
INDUCTIONS OF WCD	83	80	67	101	331	
INDUCTIONS OF WCD	6	14	4	10	34	
INDUCTIONS OF WCD	89	101	79	119	388	
INDUCTIONS OF WCD	41	17	40	31	129	
INDUCTIONS OF WCD	0	1	0	1	2	
INDUCTIONS OF WCD	147	59	142	110	458	
INDUCTIONS OF WCD	48	41	32	46	167	
INDUCTIONS OF WCD	93	92	69	81	335	
INDUCTIONS OF WCD	127	124	90	121	462	
INDUCTIONS OF WCD	20	14	5	20	59	
INDUCTIONS OF WCD	114	134	91	112	451	
INDUCTIONS OF WCD	112	108	87	138	445	

080037

TOTAL WCD INDUCTIONS

: 1247 1166 1100 1347 4860

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 20-AUG-90 TIME: 15:25:12 REPT.ID: VALID PAGE: 4

FLOW CYCLE TIME STATISTICS

ITEM	HISTORICAL FLOWTIME HOURS	AVERAGE SIMULATED FLOW TIME HOURS	STANDARD DEVIATION	SIMULATED MINIMUM FLOW TIME HOURS	SIMULATED MAXIMUM FLOW TIME HOURS	NUMBER OF SAMPLES	NUMBER OF INDUCTIONS
AC	0.00	59.13	26.95	15.07	152.04	133	411
AC/DB	0.00	86.77	57.58	2.98	322.53	407	883
DB	0.00	16.67	8.43	4.11	26.81	15	411
F-15QT	0.00	117.60	55.05	35.72	336.56	117	116
F-15SQT	0.00	77.75	7.08	72.74	82.76	2	2
F-15ST	0.00	3385.83	2399.95	319.49	11996.38	385	406
F-16QT	0.00	127.08	67.95	35.78	427.56	127	129
F-16SQT	0.00	60.49	63.18	15.82	105.17	2	2
F-16ST	0.00	3510.27	2444.91	117.75	12356.20	449	458
GG	0.00	58.14	45.86	1.25	315.18	441	886

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 20-AUG-90 TIME: 15:25:12 REPT.ID: VALID PAGE: 5

DIRECT LABOR STATISTICS

ITEM	EXPECTED HOURS	STANDARD HOURS	SIMULATED AVERAGE LABOR HOURS	STANDARD DEVIATION	SIMULATED MINIMUM LABOR HOURS	SIMULATED MAXIMUM LABOR HOURS	NUMBER OF SAMPLES
AC	31.41	0.00	31.85	13.11	8.83	70.10	133
AC/DB	42.04	0.00	39.85	30.51	2.68	159.50	407
DB	10.19	0.00	8.51	4.74	1.13	16.02	15
F-15QT	83.56	0.00	76.64	35.82	21.35	207.59	117
F-15SQT	29.40	0.00	30.65	6.63	25.96	35.34	2
F-15ST	166.80	0.00	98.04	52.47	8.01	341.05	385
F-16QT	83.56	0.00	83.89	44.57	22.58	279.11	127
F-16SQT	29.40	0.00	14.35	8.37	8.44	20.27	2
F-16ST	159.30	0.00	107.07	55.20	23.72	423.73	449
GG	33.44	0.00	34.90	27.95	0.68	152.86	441

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 20-AUG-90 TIME: 15:25:12 REPT.ID: VALID PAGE: 6

BACKSHOP DWELL SUMMARY

080038

180

ITEM	AVERAGE SIMULATED BACKSHOP HOURS	STANDARD DEVIATION	SIMULATED MINIMUM BACKSHOP HOURS	SIMULATED MAXIMUM BACKSHOP HOURS	NUMBER OF SAMPLES
AC	0.00	0.00	0.00	0.00	133
AC/DB	0.00	0.00	0.00	0.00	407
DB	0.00	0.00	0.00	0.00	15
F-15QT	0.00	0.00	0.00	0.00	117
F-15SQT	0.00	0.00	0.00	0.00	2
F-15ST	2992.00	2342.66	0.00	11452.69	385
F-16QT	0.00	0.00	0.00	0.00	127
F-16SQT	0.00	0.00	0.00	0.00	2
F-16ST	3094.74	2381.87	0.00	11886.86	449
GG	0.00	0.00	0.00	0.00	441
ALC: SA RCC: MATPFA QUARTER: 4 DATE: 20-AUG-90 TIME: 15:25:12 REPT.ID: VALID PAGE: 7					

PROCESS TIMES SUMMARY

ITEM	HISTOR. FLOW HOURS	SIMULATED FLOW HOURS	WAITING FOR RESOURCES HOURS	PROCESSING FLOW HOURS	BACKSHOP HOURS	NUMBER OF SAMPLES
AC	0.0	59.1	3.6	55.5	0.0	133
AC/DB	0.0	86.8	25.8	61.0	0.0	407
DB	0.0	16.7	1.7	15.0	0.0	15
F-15QT	0.0	117.6	12.7	104.9	0.0	117
F-15SQT	0.0	77.8	35.2	42.6	0.0	2
F-15ST	0.0	3385.8	104.5	289.4	2992.0	385
F-16QT	0.0	127.1	12.9	114.2	0.0	127
F-16SQT	0.0	60.5	36.6	23.9	0.0	2
F-16ST	0.0	3510.3	124.7	290.9	3094.7	449
GG	0.0	58.1	7.6	50.5	0.0	441

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 20-AUG-90 TIME: 15:25:12 REPT.ID: VALID PAGE: 8

RESOURCE QUEUE STATISTICS

RESOURCE QUEUE	AVERAGE QUEUE QUANTITY	STANDARD DEVIATION	MAXIMUM QUEUE QUANTITY	AVERAGE QUEUE WAIT (hrs)	CURRENT QUEUE QUANTITY	THE BLAKE STATISTIC
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080039

50002	EQ	0.00	0.00	27.00	0.00	9	0.00
50004	EQ	0.00	0.01	8.00	0.00	2	0.00
50005	EQ	0.00	0.04	6.00	0.01	2	0.00
50173	EQ	0.00	0.00	3.00	0.00	0	0.00
WG00	MP	1.95	2.72	13.00	1.76	6	3.44
WG09	MP	0.24	0.59	5.00	2.36	0	0.58
WG10	MP	1.99	2.93	19.00	1.52	0	3.02
WG11	MP	7.79	9.82	50.00	0.95	27	7.42
WGSW	MP	0.23	0.56	9.00	0.91	0	0.21

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 20-AUG-90 TIME: 15:25:12 REPT.ID: VALID PAGE: 9

ASSEMBLY STATISTICS

PARENT ITEM	TOTAL INDUCT	DELAYED OPERATIONS	WAIT (HOURS) AVERAGE	-----WAITING QUEUE COUNT-----		
				AVERAGE	STD.DEV.	MAXIMUM
AC/DB	883	145	55.9	0.9	1.0	5.0
F-15ST	406	343	69.9	2.7	1.9	11.0
F-16ST	458	514	73.0	4.3	2.5	16.0

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 20-AUG-90 TIME: 15:25:12 REPT.ID: VALID PAGE: 10

WORK IN PROCESS

ITEM	ALLOWABLE QUANTITY	AVERAGE	STD.DEV.	MINIMUM	MAXIMUM	CURRENT	AVERAGE		CURRENT	
							WAITING TIME	QUANTITY WAITING	WAITING TIME	QUANTITY WAITING
AC	99999	0.9	1.0	0	5	3	**	NONE	**	**
AC/DB	99999	4.1	2.2	0	11	6	**	NONE	**	**
DB	99999	0.0	0.2	0	1	0	**	NONE	**	**
F-15QT	99999	1.6	1.3	0	7	1	**	NONE	**	**
F-15SQT	99999	0.0	0.1	0	1	0	**	NONE	**	**
F-15ST	99999	176.9	19.9	136	209	195	**	NONE	**	**
F-16QT	99999	1.9	1.3	0	7	3	**	NONE	**	**
F-16SQT	99999	0.0	0.1	0	1	0	**	NONE	**	**
F-16ST	99999	194.8	19.0	148	228	199	**	NONE	**	**
GG	99999	2.9	2.1	0	11	4	**	NONE	**	**

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 20-AUG-90 TIME: 15:25:12 REPT.ID: VALID PAGE: 11

DEDICATED STOCK STATISTICS - Parallel Operations

STOCK ITEM TOTAL DELAYED WAIT -----WAITING QUEUE COUNT-----
 INDUCT OPERATIONS (HOURS) AVERAGE AVERAGE STD.DEV. MAXIMUM CURRENT
 ----- ----- ----- ----- -----
 ALC: SA RCC: MATPFA QUARTER: 4 DATE: 20-AUG-90 TIME: 15:25:12 REPT.ID: VALID PAGE: 12

DEDICATED STOCK STATISTICS - Subcomponents

STOCK ITEM TOTAL DELAYED WAIT -----WAITING QUEUE COUNT-----
 INDUCT OPERATIONS (HOURS) AVERAGE AVERAGE STD.DEV. MAXIMUM CURRENT
 ----- ----- ----- ----- -----
 AC 411 408 0.4 0.0 0.1 2.0 0
 AC/DB 883 878 0.0 0.0 0.0 1.0 0
 DB 411 411 19.1 0.9 0.9 6.0 3
 GG 886 882 0.0 0.0 0.0 1.0 0
 ALC: SA RCC: MATPFA QUARTER: 4 DATE: 20-AUG-90 TIME: 15:25:12 REPT.ID: VALID PAGE: 13

RESOURCE UTILIZATION BY SHIFT

CODE	DESCRIPTION	SHIFT	NUMBER	AVAIL.	AVERAGE NUMBER IN EACH STATE				BATCHING			AVC
					PREV.	IN USE	MAINT.	FAILURE	MIN	MAX	AVG	
		UTIL.			IDLE				SIZE	SIZE	SIZE	PAJ
50002	50002	1	32.0	0.45	0.52	0.43	0.00	0.05				
		2	32.0	0.39	0.58	0.37	0.00	0.05				
		3	32.0	0.37	0.59	0.36	0.00	0.05				
		4	32.0	0.33	0.63	0.32	0.00	0.05				
		5	32.0	0.29	0.68	0.27	0.00	0.05				
		6	32.0	0.28	0.68	0.27	0.00	0.05				
50004	50004	1	9.8	0.22	0.76	0.21	0.00	0.03				
		2	9.8	0.17	0.80	0.17	0.00	0.03				
		3	9.8	0.08	0.89	0.08	0.00	0.03				
		4	9.8	0.20	0.78	0.19	0.00	0.03				
		5	9.8	0.20	0.78	0.19	0.00	0.03				
		6	9.8	0.16	0.82	0.15	0.00	0.03				
50005	50005	1	5.8	0.23	0.75	0.23	0.00	0.02				
		2	5.8	0.16	0.82	0.16	0.00	0.02				
		3	5.8	0.10	0.88	0.10	0.00	0.02				
		4	5.8	0.20	0.78	0.20	0.00	0.02				
		5	5.8	0.19	0.79	0.19	0.00	0.02				
		6	5.8	0.15	0.83	0.15	0.00	0.02				

184

50173 J0173

1	16.5	0.02	0.98	0.02	0.00	0.00
2	16.5	0.02	0.98	0.02	0.00	0.00
3	16.5	0.01	0.99	0.01	0.00	0.00
4	16.5	0.02	0.98	0.02	0.00	0.00
5	16.5	0.00	1.00	0.00	0.00	0.00
6	16.5	0.01	0.98	0.01	0.00	0.00

WG00

1	37.0	0.15	0.49	0.09	0.00	0.43
2	10.0	0.50	0.29	0.29	0.00	0.43
3	9.0	0.48	0.30	0.28	0.00	0.43
4	14.0	0.30	0.40	0.17	0.00	0.43
5	16.0	0.24	0.44	0.14	0.00	0.43
6	8.0	0.47	0.31	0.27	0.00	0.43

WG09

1	4.0	0.13	0.56	0.08	0.00	0.36
2	2.5	0.17	0.53	0.11	0.00	0.36
3	1.0	0.36	0.41	0.23	0.00	0.36
4	2.0	0.22	0.50	0.14	0.00	0.36
5	0.0	NO VALUES RECORDED				
6	1.0	0.39	0.39	0.25	0.00	0.36

Note: Remember that the utilizations reflect only 80% of the workload and the other 20% may not be spread evenly across all resources.

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 20-AUG-90 TIME: 15:25:12 REPT.ID: VALID PAGE: 14

RESOURCE UTILIZATION by SHIFT

CODE	DESCRIPTION	SHIFT	NUMBER AVAIL.	SHIFT UTIL.	AVERAGE NUMBER IN EACH STATE				BATCHING			AVG SIZE	AVG PAI
					IDLE	IN USE	PREV. MAINT.	FAILURE	OTHER DOWN	MIN SIZE	MAX SIZE		
WG10	WG10	1	8.8	0.55	0.38	0.47	0.00	0.00	0.15				
		2	4.5	0.79	0.18	0.67	0.00	0.00	0.15				
		3	2.0	0.94	0.05	0.80	0.00	0.00	0.15				
		4	6.0	0.70	0.26	0.59	0.00	0.00	0.15				
		5	6.0	0.68	0.27	0.58	0.00	0.00	0.15				
		6	4.0	0.82	0.16	0.69	0.00	0.00	0.15				
WG11	WG11	1	21.0	0.70	0.25	0.60	0.00	0.00	0.15				
		2	14.3	0.87	0.11	0.74	0.00	0.00	0.15				
		3	14.3	0.88	0.11	0.74	0.00	0.00	0.15				
		4	11.0	0.95	0.04	0.81	0.00	0.00	0.15				
		5	9.0	0.98	0.02	0.83	0.00	0.00	0.15				
		6	9.0	0.98	0.01	0.84	0.00	0.00	0.15				

080042

Note: Remember that the utilizations reflect
c / 80% of the workload and the other
20% may not be spread evenly across all
resources

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 20-AUG-90 TIME: 15:25:12 REPT.ID: VALID PAGE: 15

ITEM NAME: AC WCD NAME: SLOTHRU5

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL QTY	PROCESSED QTY	QUEUED QTY	QUEUED HRS	AVERAGE SCHEDULED HRS	AVERAGE SIMULATED HRS	DESC	RCC	OCC FAC
0100	136.	136.	0.	0.00	3.05	5.40	ASSY	MATPFA	1.00
0200	136.	136.	0.	0.00	5.60	9.32	REP	MATPFA	1.00
0300 S	134.	102.	24.	8.68	2.23	4.02	TEST	MATPFA	0.75 WG09,50173
0400	134.	106.	5.	13.09	4.14	7.24	TEST	MATPFA	0.75 WG09,50173
0500	134.	102.	12.	0.49	5.16	9.13	ASSY	MATPFA	0.75 WG00
0600 S	134.	134.	21.	8.75	2.04	3.26	TEST	MATPFA	1.00 WG09,50173
0700	134.	134.	0.	0.00	8.08	14.41	TEST	MATPFA	1.00
0800	134.	10.	2.	0.40	8.47	14.93	REP	MATPFA	0.10 WG00
0900 S	134.	8.	0.	0.00	1.54	2.53	TEST	MATPFA	0.10
1000	134.	14.	0.	0.00	5.77	9.98	TEST	MATPFA	0.10
1100	134.	134.	13.	1.16	3.04	5.05	ASSY	MATPFA	1.00 WG00
ALC: SA	RCC: MATPFA	QUARTER: 4	DATE: 20-AUG-90	TIME: 15:25:12	REPT.ID: VALID	PAGE: 16			

ITEM NAME: AC/DB WCD NAME: SLOTHRU4

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL QTY	PROCESSED QTY	QUEUED QTY	QUEUED HRS	AVERAGE SCHEDULED HRS	AVERAGE SIMULATED HRS	DESC	RCC	OCC FAC
0100	412.	412.	1.	0.49	2.66	4.48	REP	MATPFA	1.00 WG00

0200 411. 411. 0. 0.00 2.59 5.20 DSSY MATPFA 1.00
 0300 411. 142. 56.49 3.60 6.30 ASSY MATPFA 1.00
 0400 S 409. 129. 11.92 2.73 3.75 TEST MATPFA 0.35 WG00,as
 0500 409. 147. 9.95 22.04 32.48 TEST MATPFA 0.35 WG10,50002
 0600 S 409. 261. 13.23 2.39 3.03 TEST MATPFA 0.65 WG10,50005
 0700 409. 258. 13.00 26.28 39.33 TEST MATPFA 0.65 WG10,50005
 0800 408. 41. 1.02 3.17 5.25 REP MATPFA 0.10 WG00
 0900 S 408. 121. 11.37 2.80 3.94 TEST ATPFA 0.30 WG10,50002
 1000 408. 14. 0.00 23.14 28.59 TEST MATPFA 0.03
 1100 S 408. 31. 32.76 2.73 4.07 TEST MATPFA 0.07 WG10,50005
 1200 408. 22. 12.35 36.25 58.23 TEST MATPFA 0.07 WG10,50005
 ALC: SA RCC: MATPFA QUARTER: 4 DATE: 20-AUG-90 TIME: 15:25:12 REPT.ID: VALID PAGE: 17

ITEM NAME: DB WCD NAME: SLOTHRU6

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL QTY	PROCESSED QTY	QUEUED QTY	QUEUED HRS	AVERAGE SCHEDULED HRS	AVERAGE SIMULATED HRS	DESC	RCC	OCC FAC
0100	15.	15.	0.	0.00	2.54	4.58	REP	MATPFA	1.00
0200 S	15.	15.	5.	4.99	1.83	2.56	TEST	MATPFA	1.00
0300	15.	15.	0.	0.00	3.96	7.67	TEST	MATPFA	1.00
0400	15.	0.	0.	0.00	0.00	0.00	REP	MATPFA	0.05
0500 S	15.	2.	0.	0.00	1.41	1.41	TEST	MATPFA	0.05
0600	15.	0.	0.	0.00	0.00	0.00	TEST	MATPFA	0.05

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 20-AUG-90 TIME: 15:25:12 REPT.ID: VALID PAGE: 18

ITEM NAME: F-15QT WCD NAME: QUIKTHRU

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL QTY	PROCESSED QTY	QUEUED QTY	QUEUED HRS	AVERAGE SCHEDULED HRS	AVERAGE SIMULATED HRS	DESC	RCC	OCC FAC
0000	116.	116.	0.	0.00	2.00	2.00	IN	MATPFA	1.00
0100	116.	116.	116.	1.40	5.30	8.70	INSP	MATPFA	1.00
0200 S	116.	116.	66.	19.70	6.39	7.42	TEST	MATPFA	1.00
0300	116.	116.	0.	0.00	19.30	24.42	TEST	MATPFA	1.00
0400	117.	33.	0.	0.00	15.60	19.39	TEST	MATPFA	0.28
0500	117.	117.	0.	0.00	24.15	31.42	TEST	MATPFA	1.00

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 20-AUG-90 TIME: 15:25:12 REPT.ID: VALID PAGE: 18

0600 117. 117. 0. 0.00 13.2 16.06 MATPFA 1.00
 0700 117. 117. 0. 0.00 1.68 1.94 MATPFA 1.00 WGSW
 0800 117. 117. 31. 1.29 2.40 3.80 MATPFA 1.00
 9999 117. 117. 0. 0.00 4.00 4.00 OUT MATPFA 1.00
 ALC: SA RCC: MATPFA QUARTER: 4 DATE: 20-AUG-90 TIME: 15:25:12 REPT.ID: VALID PAGE: 19

ITEM NAME: F-15ST WCD NAME: SUPQTHRU

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL QTY	PROCESSED QTY	QUEUED QTY	QUEUED HRS	AVERAGE SCHEDULED HRS	AVERAGE SIMULATED HRS	DESC	RCC	OCC FAC
0000	2.	2.	0.	0.00	2.00	2.00	IN	MATPFA	1.00
0100	2.	2.	2.	35.20	5.30	5.30	INSP	MATPFA	1.00
0200 S	2.	2.	0.	0.00	5.30	6.50	TEST	MATPFA	1.00
0300	2.	2.	0.	0.00	16.46	19.46	TEST	MATPFA	1.00
0350	2.	2.	0.	0.00	1.12	1.12	TEST	MATPFA	1.00
0400	2.	2.	0.	0.00	2.47	4.17	PACK	MATPFA	1.00
9999	2.	2.	0.	0.00	4.00	4.00	OUT	MATPFA	1.00

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 20-AUG-90 TIME: 15:25:12 REPT.ID: VALID PAGE: 20

ITEM NAME: F-15ST WCD NAME: SLOTHRUI

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL QTY	PROCESSED QTY	QUEUED QTY	QUEUED HRS	AVERAGE SCHEDULED HRS	AVERAGE SIMULATED HRS	DESC	RCC	OCC FAC
0000	406.	406.	0.	0.00	105.12	104.52	IN	MATWIP	1.00
0100	406.	406.	181.	1.84	5.30	8.97	INSP	MATPFA	1.00
0200 S	407.	283.	178.	26.05	6.22	7.24	TEST	MATPFA	0.70
0300	403.	284.	50.	21.21	21.75	27.78	TEST	MATPFA	0.70
0400	404.	404.	0.	0.00	1875.76	1876.08	WIP	WIP	1.00

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 20-AUG-90 TIME: 15:25:12 REPT.ID: VALID PAGE: 21

ITEM NAME: F-15ST WCD NAME: AWP-G

080044

187

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL QTY	PROCESSED QTY	QUEUED QTY	QUEUED HRS	AVERAGE SCHEDULED HRS	AVERAGE SIMULATED HRS	DESC	RCC	OCC FAC
0050	152.	152.	0.	0.00	168.00	168.00	8DAY	MATPFA	1.00
0100	153.	35.	0.	0.00	1410.68	1415.39	AWP	AWP	0.28
0200	157.	122.	0.	0.00	4999.50	4678.84	GCON	G-COND	0.72
ALC: SA	RCC: MATPFA	QUARTER: 4	DATE: 20-AUG-90	TIME: 15:25:12	REPT.ID: VALID	PAGE: 22			

ITEM NAME: F-15ST WCD NAME: SLOTHRU0

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL QTY	PROCESSED QTY	QUEUED QTY	QUEUED HRS	AVERAGE SCHEDULED HRS	AVERAGE SIMULATED HRS	DESC	RCC	OCC FAC
0300	287.	59.	34.	27.11	22.07	27.79	TEST	MATPFA	0.19
0400	286.	123.	64.	23.84	24.79	32.31	TEST	MATPFA	0.46
0500	284.	75.	21.	14.79	11.01	13.08	TEST	MATPFA	0.30
ALC: SA	RCC: MATPFA	QUARTER: 4	DATE: 20-AUG-90	TIME: 15:25:12	REPT.ID: VALID	PAGE: 23			

ITEM NAME: F-15ST WCD NAME: SLOTHRU1

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL QTY	PROCESSED QTY	QUEUED QTY	QUEUED HRS	AVERAGE SCHEDULED HRS	AVERAGE SIMULATED HRS	DESC	RCC	OCC FAC
0100	73.	73.	28.	1.67	1.77	2.60	REP	MATPFA	1.00
0200 S	73.	73.	43.	24.49	4.87	5.51	TEST	MATPFA	1.00
0300	72.	53.	0.	0.00	24.64	32.49	TEST	MATPFA	0.75
ALC: SA	RCC: MATPFA	QUARTER: 4	DATE: 20-AUG-90	TIME: 15:25:12	REPT.ID: VALID	PAGE: 24			

ITEM NAME: F-15ST WCD NAME: SLOTHRU7

080045

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL QTY	PROCESSED QTY	QUEUED QTY	QUEUED HRS	AVERAGE SCHEDULED HRS	AVERAGE SIMULATED HRS	DESC	RCC	OCC FAC
0010	331.	331.	0.	0.00	0.00	0.00	DSSY	MATPFA	1.00 NR
0020	331.	331.	169.	51.63	0.00	0.00	ASSY	MATPFA	1.00 NR,as
0050	329.	329.	117.	1.30	2.38	3.73	DSSY	MATPFA	1.00 WG00,50002
0100	329.	329.	143.	87.34	3.36	5.58	ASSY	MATPFA	1.00 WG00,50002,as
0200 S	326.	326.	189.	23.95	6.29	7.53	TEST	MATPFA	1.00 WG11,50002
0300	324.	324.	0.	0.00	25.54	31.80	TEST	MATPFA	1.00
0400	322.	322.	0.	0.00	13.90	17.03	TEST	MATPFA	1.00

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 20-AUG-90 TIME: 15:25:12 REPT.ID: VALID PAGE: 25

ITEM NAME: F-15ST WCD NAME: SLOTHRU7

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL QTY	PROCESSED QTY	QUEUED QTY	QUEUED HRS	AVERAGE SCHEDULED HRS	AVERAGE SIMULATED HRS	DESC	RCC	OCC FAC
0010	34.	34.	0.	0.00	0.00	0.00	DSSY	MATPFA	1.00 NR
0020	34.	34.	11.	72.77	0.00	0.00	ASSY	MATPFA	1.00 NR,as
0050	34.	34.	10.	1.18	2.37	3.90	DSSY	MATPFA	1.00 WG00,50002
0100	35.	35.	15.	106.92	3.13	4.97	ASSY	MATPFA	1.00 WG00,50002,as
0200 S	35.	35.	14.	23.30	5.95	6.98	TEST	MATPFA	1.00 WG11,50002
0300	34.	34.	0.	0.00	35.79	46.57	TEST	MATPFA	1.00
0400	34.	34.	0.	0.00	13.28	16.15	TEST	MATPFA	1.00

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 20-AUG-90 TIME: 15:25:12 REPT.ID: VALID PAGE: 26

ITEM NAME: F-15ST WCD NAME: SLOTHRU3

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL QTY	PROCESSED QTY	QUEUED QTY	QUEUED HRS	AVERAGE SCHEDULED HRS	AVERAGE SIMULATED HRS	DESC	RCC	OCC FAC
0100	388.	388.	221.	25.47	1.63	1.83	TEST	MATPFA	1.00 WG11,50002
0200	385.	385.	169.	1.20	2.62	3.95	PACK	MATPFA	1.00 WGSW

0800046

189

9999 385. 385. 0. 0.00 3.60 6.44 OUT MATPFA 1.00

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 20-AUG-90 TIME: 15:25:12 REPT.ID: VALID PAGE: 27

ITEM NAME: F-16QT WCD NAME: QUIKTHRU

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL QTY	PROCESSED QTY	QUEUED QTY	QUEUED HRS	AVERAGE SCHEDULED HRS	AVERAGE SIMULATED HRS	DESC	RCC	OCC
0000	129.	129.	0.	0.00	2.00	2.00	IN	MATPFA	1.00
0100	129.	129.	129.	1.40	5.30	8.70	INSP	MATPFA	1.00
0200 S	129.	129.	66.	22.57	6.24	7.21	TEST	MATPFA	1.00
0300	128.	128.	0.	0.00	19.38	24.09	TEST	MATPFA	1.00
0400	128.	30.	0.	0.00	21.73	26.65	TEST	MATPFA	0.28
0500	128.	128.	0.	0.00	29.36	38.62	TEST	MATPFA	1.00
0600	128.	128.	0.	0.00	14.02	17.06	TEST	MATPFA	1.00
0700	128.	128.	0.	0.00	1.60	1.84	TEST	MATPFA	1.00
0800	127.	127.	36.	1.11	2.60	4.21	PACK	MATPFA	1.00
9999	127.	127.	0.	0.00	4.00	4.00	OUT	MATPFA	1.00
ALC: SA	RCC: MATPFA	QUARTER: 4	DATE: 20-AUG-90	TIME: 15:25:12	REPT.ID: VALID	PAGE: 28			

ITEM NAME: F-16SQT WCD NAME: SUPQTHRU

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL QTY	PROCESSED QTY	QUEUED QTY	QUEUED HRS	AVERAGE SCHEDULED HRS	AVERAGE SIMULATED HRS	DESC	RCC	OCC
0000	2.	2.	0.	0.00	2.00	2.00	IN	MATPFA	1.00
0100	2.	2.	1.	71.20	5.30	5.30	INSP	MATPFA	1.00
0200 S	2.	2.	0.	0.00	2.77	3.37	TEST	MATPFA	1.00
0300	2.	2.	0.	0.00	2.57	3.17	TEST	MATPFA	1.00
0350	2.	2.	0.	0.00	0.31	0.91	TEST	MATPFA	1.00
0400	2.	2.	2.	1.04	3.39	5.09	PACK	MATPFA	1.00
9999	2.	2.	0.	0.00	4.00	4.00	OUT	MATPFA	1.00
ALC: SA	RCC: MATPFA	QUARTER: 4	DATE: 20-AUG-90	TIME: 15:25:12	REPT.ID: VALID	PAGE: 29			

0000047

ITEM NAME: F-16ST WCD NAME: SLOTHRUI

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL QTY	PROCESSED QTY	QUEUED QTY	QUEUED HRS	AVERAGE SCHEDULED HRS	AVERAGE SIMULATED HRS	DESC	RCC	OCC FAC
0000	458.	458.	0.	0.00	104.01	105.41	IN	MATWIP	1.00
0100	461.	461.	202.	1.77	5.30	8.94	INSP	MATPFA	1.00
0200 S	461.	317.	176.	22.90	6.13	7.20	TEST	MATPFA	0.70
0300	461.	319.	56.	24.88	20.82	26.23	TEST	MATPFA	0.70
0400	458.	458.	0.	0.00	1872.11	1880.36	WIP	WIP	1.00
ALC: SA	RCC: MATPFA	QUARTER: 4	DATE: 20-AUG-90	TIME: 15:25:12	REPT.ID: VALID	PAGE: 30			

ITEM NAME: F-16ST WCD NAME: AWP-G

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL QTY	PROCESSED QTY	QUEUED QTY	QUEUED HRS	AVERAGE SCHEDULED HRS	AVERAGE SIMULATED HRS	DESC	RCC	OCC FAC
0050	167.	167.	0.	0.00	168.00	168.00	8DAY	MATPFA	1.00
0100	165.	41.	0.	0.00	1312.39	1436.34	AWP	AWP	0.28
0200	164.	124.	0.	0.00	4880.52	4732.56	GCON	G-COND	0.72
ALC: SA	RCC: MATPFA	QUARTER: 4	DATE: 20-AUG-90	TIME: 15:25:12	REPT.ID: VALID	PAGE: 31			

ITEM NAME: F-16ST WCD NAME: SLOTHRU0

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL QTY	PROCESSED QTY	QUEUED QTY	QUEUED HRS	AVERAGE SCHEDULED HRS	AVERAGE SIMULATED HRS	DESC	RCC	OCC FAC
0300	335.	63.	41.	17.15	20.61	24.76	TEST	MATPFA	0.19
0400	334.	144.	65.	24.07	28.40	35.24	TEST	MATPFA	0.46
0500	334.	116.	38.	24.11	13.26	16.23	TEST	MATPFA	0.30
ALC: SA	RCC: MATPFA	QUARTER: 4	DATE: 20-AUG-90	TIME: 15:25:12	REPT.ID: VALID	PAGE: 32			

ITEM NAME: F-16ST WCD NAME: SLOTHRU7

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL PROCESSED		QUEUED		AVERAGE SCHEDULED HRS		AVERAGE SIMULATED HRS		DESC	RCC	OCC	
	QTY	QTY	QTY	HRS	HRS	HRS	HRS	HRS			FAC	
0010	462.	462.	0.	0.00	0.00	0.00	0.00	0.00	DSSY	MATPFA	1.00	NR
0020	462.	462.	235.	61.37	0.00	0.00	0.00	0.00	ASSY	MATPFA	1.00	NR,as
0050	462.	462.	168.	1.36	2.68	4.23	4.23	4.23	DSSY	MATPFA	1.00	WG00,50002
0100	462.	462.	225.	84.39	3.43	5.68	5.68	5.68	ASSY	MATPFA	1.00	WG00,50002,as
0200 S	460.	460.	279.	23.23	6.02	7.03	7.03	7.03	TEST	MATPFA	1.00	WG11,50002
0300	457.	457.	0.	0.00	26.33	33.37	33.37	33.37	TEST	MATPFA	1.00	
0400	456.	456.	0.	0.00	14.58	17.86	17.86	17.86	TEST	MATPFA	1.00	

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 20-AUG-90 TIME: 15:25:12 REPT.ID: VALID PAGE: 33

ITEM NAME: F-16ST WCD NAME: SLOTHRU7

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL PROCESSED		QUEUED		AVERAGE SCHEDULED HRS		AVERAGE SIMULATED HRS		DESC	RCC	OCC	
	QTY	QTY	QTY	HRS	HRS	HRS	HRS	HRS			FAC	
0010	59.	59.	0.	0.00	0.00	0.00	0.00	0.00	DSSY	MATPFA	1.00	NR
0020	59.	59.	26.	65.08	0.00	0.00	0.00	0.00	ASSY	MATPFA	1.00	NR,as
0050	57.	57.	19.	1.08	3.01	4.86	4.86	4.86	DSSY	MATPFA	1.00	WG00,50002
0100	57.	57.	24.	99.55	3.27	5.37	5.37	5.37	ASSY	MATPFA	1.00	WG00,50002,as
0200 S	57.	57.	31.	26.18	6.63	7.72	7.72	7.72	TEST	MATPFA	1.00	WG11,50002
0300	55.	55.	0.	0.00	28.75	39.16	39.16	39.16	TEST	MATPFA	1.00	
0400	55.	55.	0.	0.00	13.86	16.61	16.61	16.61	TEST	MATPFA	1.00	

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 20-AUG-90 TIME: 15:25:12 REPT.ID: VALID PAGE: 34

ITEM NAME: F-16ST WCD NAME: SLOTHRU3

WCD by OPERATION STATISTIC AVERAGES

OPER	POTENTIAL PROCESSED	QUEUED	QUEUED	AVERAGE SCHEDULED	AVERAGE SIMULATED	OCC

0800043

192

CODE	QTY	QTY	QTY	HRS	HRS	HRS	DESC	RCC	FAC
0100	451.	451.	243.	24.16	1.58	1.93	TEST	MATPFA	1.00
0200	449.	449.	200.	1.28	2.47	3.78	PACK	MATPFA	1.00
9999	449.	449.	0.	0.00	4.07	6.93	OUT	MATPFA	1.00

WG11,50002
WGSW

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 20-AUG-90 TIME: 15:25:12 REPT.ID: VALID PAGE: 35

ITEM NAME: GG WCD NAME: SLOTHRU2

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL QTY	PROCESSED QTY	QUEUED QTY	QUEUED HRS	AVERAGE SCHEDULED HRS	AVERAGE SIMULATED HRS	DESC	RCC	OCC FAC
0100	445.	445.	161.	1.22	3.57	5.69	REP	MATPFA	1.00
0200 S	443.	443.	235.	13.44	2.90	3.61	TEST	MATPFA	1.00
0300	443.	443.	0.	0.00	25.50	36.63	TEST	MATPFA	1.00
0400	441.	47.	15.	1.17	2.72	4.24	REP	MATPFA	0.10
0500 S	441.	32.	1.	12.71	3.76	5.37	TEST	MATPFA	0.10
0550	441.	48.	1.	4.32	23.36	34.38	TEST	MATPFA	0.10

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 20-AUG-90 TIME: 15:25:12 REPT.ID: VALID PAGE: 36

BACKSHOP DWELL TIMES BY BACKSHOP RCC

ITEM	RCC	AVERAGE HOURS
AC	*** NO BACKSHOP ACTIVITY	*****
AC/DB	*** NO BACKSHOP ACTIVITY	*****
DB	*** NO BACKSHOP ACTIVITY	*****
F-15QT	*** NO BACKSHOP ACTIVITY	*****
OF-15SQT	*** NO BACKSHOP ACTIVITY	*****

WIP 1876.08
AWP 323.78
G-COND 3635.79

00050

F-16QT *** NO BACKSHOP ACTIVITY *****

F-16SQT *** NO BACKSHOP ACTIVITY *****

F-16ST WIP 1880.36

F-16ST AWP 356.91

F-16ST G-COND 3578.28

GG *** NO BACKSHOP ACTIVITY *****

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 20-AUG-90 TIME: 15:25:12 REPT.ID: VALID PAGE: 37

HISTORICAL vs. SIMULATED COMPARISON

ITEM	HISTORICAL VALUES			SIMULATED VALUES			WORKLOAD		PERCENTAGE DIFFERENCE
	FLOWTIME HOURS	STANDARD DEVIATION	SAMPLE SIZE	FLOWTIME HOURS	STANDARD DEVIATION	SAMPLE SIZE	WEIGHT		
AC	0.00	0.00	0	59.13	26.95	133	0.000		0.00
AC/DB	0.00	0.00	0	86.77	57.58	407	0.000		0.00
DB	0.00	0.00	0	16.67	8.43	15	0.000		0.00
F-15QT	0.00	0.00	0	117.60	55.05	117	0.000		0.00
F-15SQT	0.00	0.00	0	77.75	7.08	2	0.000		0.00
F-15ST	0.00	0.00	0	3385.83	2399.95	385	0.000		0.00
F-16QT	0.00	0.00	0	127.08	67.95	127	0.000		0.00
F-16SQT	0.00	0.00	0	60.49	63.18	2	0.000		0.00
F-16ST	0.00	0.00	0	3510.27	2444.91	449	0.000		0.00
GG	0.00	0.00	0	58.14	45.86	441	0.000		0.00

ITEM AC EXCLUDED FROM VALIDATION TEST DUE TO INSUFFICIENT DATA

ITEM AC/DB EXCLUDED FROM VALIDATION TEST DUE TO INSUFFICIENT DATA

ITEM DB EXCLUDED FROM VALIDATION TEST DUE TO INSUFFICIENT DATA

ITEM F-15QT EXCLUDED FROM VALIDATION TEST DUE TO INSUFFICIENT DATA

ITEM F-15SQT EXCLUDED FROM VALIDATION TEST DUE TO INSUFFICIENT DATA

ITEM F-15ST EXCLUDED FROM VALIDATION TEST DUE TO INSUFFICIENT DATA

ITEM F-16QT EXCLUDED FROM VALIDATION TEST DUE TO INSUFFICIENT DATA

ITEM F-16SQT EXCLUDED FROM VALIDATION TEST DUE TO INSUFFICIENT DATA

ITEM F-16ST EXCLUDED FROM VALIDATION TEST DUE TO INSUFFICIENT DATA

ITEM GG EXCLUDED FROM VALIDATION TEST DUE TO INSUFFICIENT DATA

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 20-AUG-90 TIME: 15:25:12 REPT.ID: VALID PAGE: 38

HISTORICAL vs. SIMULATED COMPARISON

NOT ENOUGH ITEMS REMAINING TO CONDUCT VALIDATION TEST

MODEL RUN #2

ALC: S. RCC: MATPFA QUARTER: 4 DATE: 21-AUG-90 13:54:05 REPT.ID: VALID PAGE: 1

RUN PARAMETERS

SEEDA2 :

This job was run on SAALC, a little tiny vax.

ALC: SA

RCC: MATPFA

REPORT ID: VALID

UFC AREA - VALIDATION VERSION

PART FILE: UFCPART.val
RES FILE: UFCRES.val
OPER FILE: UFCOPS.val
ETC FILE: UFCETC.val

WEEKENDS = Y

NUMBER OF QUARTERS = 4

WARM UP PERIOD; STATS WILL BE CLEARED AT DAY 270

OF HOLIDAYS 0

HISTORICAL DATA SHIFT FACTOR 8.000000

BACKSHOP DATA SHIFT FACTOR 24.000000

NEW DATA FORMATS SELECTED

SIMULATION CPU TIME: 26.89 MINUTES

SIMULATION LAPSE TIME: 27.87 MINUTES

SIMULATION RUN LENGTH: 15216.00 HOURS

Number of Items : 10

Number of Resources : 9

Number of WCDs : 21

Number of Operations : 76

Operations completed : 29695

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 21-AUG-90 TIME: 13:54:05 REPT.ID: VALID PAGE: 2

000054

ITEM INDUCTIONS

	1ST QTR	2ND QTR	3RD QTR	4TH QTR	YTD	
INDUCTIONS OF ITEM AC	104	112	92	107	415	(MISTR)
INDUCTIONS OF ITEM AC/DB	208	218	191	211	828	(MISTR)
INDUCTIONS OF ITEM DB	104	112	92	107	415	(MISTR)
INDUCTIONS OF ITEM F-15QT	23	23	39	31	116	(MISTR)
INDUCTIONS OF ITEM F-15SQT	1	0	1	0	2	(MISTR)
INDUCTIONS OF ITEM F-15ST	80	81	136	109	406	(MISTR)
INDUCTIONS OF ITEM F-16QT	41	17	40	31	129	(MISTR)
INDUCTIONS OF ITEM F-16SQT	0	1	0	1	2	(MISTR)
INDUCTIONS OF ITEM F-16ST	147	59	142	110	458	(MISTR)
INDUCTIONS OF ITEM GG	206	220	188	216	830	(MISTR)

TOTAL ITEM INDUCTIONS : 914 843 921 923 3601

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 21-AUG-90 TIME: 13:54:05 REPT.ID: VALID PAGE: 3

WCD INDUCTIONS

	1ST QTR	2ND QTR	3RD QTR	4TH QTR	YTD	
INDUCTIONS OF WCD	30	25	26	32	113	
INDUCTIONS OF WCD	104	112	92	108	416	
INDUCTIONS OF WCD	1	3	3	6	13	
INDUCTIONS OF WCD	23	23	39	31	116	
INDUCTIONS OF WCD	1	0	1	0	2	
INDUCTIONS OF WCD	80	81	136	109	406	
INDUCTIONS OF WCD	33	34	37	59	163	
INDUCTIONS OF WCD	71	52	65	83	271	
INDUCTIONS OF WCD	21	20	20	16	77	
INDUCTIONS OF WCD	91	66	75	87	319	
INDUCTIONS OF WCD	8	9	8	10	35	
INDUCTIONS OF WCD	118	75	98	104	395	
INDUCTIONS OF WCD	41	17	40	31	129	
INDUCTIONS OF WCD	0	1	0	1	2	
INDUCTIONS OF WCD	147	59	142	110	458	
INDUCTIONS OF WCD	47	52	36	61	196	
INDUCTIONS OF WCD	74	94	67	87	322	
INDUCTIONS OF WCD	97	131	94	112	434	
INDUCTIONS OF WCD	10	14	11	7	42	
INDUCTIONS OF WCD	98	131	97	106	432	
INDUCTIONS OF WCD	115	127	85	103	430	

TOTAL WCD INDUCTIONS : 1210 1126 1172 1263 4771

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 21-AUG-90 TIME: 13:54:05 REPT.ID: VALID PAGE: 4

FLOW CYCLE TIME STATISTICS

ITEM	HISTORICAL FLOWTIME HOURS	AVERAGE SIMULATED FLOW TIME HOURS	STANDARD DEVIATION	SIMULATED MINIMUM FLOW TIME HOURS	SIMULATED MAXIMUM FLOW TIME HOURS	NUMBER OF SAMPLES	NUMBER OF INDUCTIONS
AC	0.00	52.67	24.81	17.95	170.12	116	415
AC/DB	0.00	81.68	56.86	3.04	369.00	417	828
DB	0.00	25.69	23.84	5.08	85.41	13	415
F-15QT	0.00	121.08	53.46	50.58	362.96	118	116
F-15SQT	0.00	49.95	43.23	19.39	80.52	2	2
F-15ST	0.00	3359.05	2388.07	115.41	12151.03	393	406
F-16QT	0.00	132.60	70.57	34.93	472.63	130	129
F-16SQT	0.00	33.59	20.33	19.21	47.96	2	2
F-16ST	0.00	3653.51	2470.83	188.83	11695.40	427	458
GG	0.00	49.29	40.18	1.38	291.57	428	830
ALC: SA RCC: MATPFA QUARTER: 4 DATE: 21-AUG-90 TIME: 13:54:05 REPT.ID: VALID PAGE: 5							

DIRECT LABOR STATISTICS

ITEM	EXPECTED HOURS	STANDARD HOURS	SIMULATED AVERAGE LABOR HOURS	STANDARD DEVIATION	SIMULATED MINIMUM LABOR HOURS	SIMULATED MAXIMUM LABOR HOURS	NUMBER OF SAMPLES
AC	31.41	0.00	29.51	13.27	10.99	86.65	116
AC/DB	42.04	0.00	41.18	32.96	2.87	223.06	417
DB	10.19	0.00	12.97	10.99	2.24	35.32	13
F-15QT	83.56	0.00	78.33	34.10	24.88	197.71	118
F-15SQT	29.40	0.00	26.79	20.64	12.19	41.38	2
F-15ST	166.80	0.00	98.76	53.27	11.75	385.67	393
F-16QT	83.56	0.00	90.56	50.27	21.73	341.82	130
F-16SQT	29.40	0.00	22.88	15.37	12.01	33.75	2
F-16ST	159.30	0.00	106.15	48.37	21.20	314.22	427
GG	33.44	0.00	31.51	25.03	1.21	139.56	428
ALC: SA RCC: MATPFA QUARTER: 4 DATE: 21-AUG-90 TIME: 13:54:05 REPT.ID: VALID PAGE: 6							

BACKSHOP DWELL SUMMARY

ITEM	AVERAGE SIMULATED		SIMULATED		SIMULATED		NUMBER OF SAMPLES
	BACKSHOP HOURS	STANDARD DEVIATION	MINIMUM BACKSHOP HOURS	MAXIMUM BACKSHOP HOURS	MINIMUM BACKSHOP HOURS	MAXIMUM BACKSHOP HOURS	
AC	0.00	0.00	0.00	0.00	0.00	0.00	116
AC/DB	0.00	0.00	0.00	0.00	0.00	0.00	417
DB	0.00	0.00	0.00	0.00	0.00	0.00	13
F-15QT	0.00	0.00	0.00	0.00	0.00	0.00	118
F-15SQT	0.00	0.00	0.00	0.00	0.00	0.00	2
F-15ST	2974.89	2322.38	0.00	11588.06	0.00	0.00	393
F-16QT	0.00	0.00	0.00	0.00	0.00	0.00	130
F-16SQT	0.00	0.00	0.00	0.00	0.00	0.00	2
F-16ST	3243.21	2396.09	0.00	11002.01	0.00	0.00	427
GG	0.00	0.00	0.00	0.00	0.00	0.00	428
ALC: SA	RCC: MATPEA	QUARTER: 4	DATE: 21-AUG-90	TIME: 13:54:05	REPT.ID: VALID	PAGE: 7	

PROCESS TIMES SUMMARY

ITEM	HISTOR. FLOW		SIMULATED FLOW		WAITING FOR RESOURCES		PROCESSING FLOW		BACKSHOP		NUMBER OF SAMPLES
	FLOW HOURS	HOURS	FLOW HOURS	HOURS	RESOURCES HOURS	%	FLOW HOURS	%	HOURS	%	
AC	0.0	0.0	52.7	1.7	3.2%	51.0	96.8%	0.0	0.0%	0.0%	116
AC/DB	0.0	0.0	81.7	20.8	25.4%	60.9	74.6%	0.0	0.0%	0.0%	417
DB	0.0	0.0	25.7	0.5	2.1%	25.2	97.9%	0.0	0.0%	0.0%	13
F-15QT	0.0	0.0	121.1	14.4	11.9%	106.7	88.1%	0.0	0.0%	0.0%	118
F-15SQT	0.0	0.0	50.0	11.9	23.7%	38.1	76.3%	0.0	0.0%	0.0%	2
F-15ST	0.0	0.0	3359.0	97.6	2.9%	286.6	8.5%	2974.9	88.6%	0.0%	393
F-16QT	0.0	0.0	132.6	11.5	8.7%	121.1	91.3%	0.0	0.0%	0.0%	130
F-16SQT	0.0	0.0	33.6	0.0	0.0%	33.6	100.0%	0.0	0.0%	0.0%	2
F-16ST	0.0	0.0	3653.5	108.2	3.0%	302.1	8.3%	3243.2	88.8%	0.0%	427
GG	0.0	0.0	49.3	4.6	9.4%	44.7	90.6%	0.0	0.0%	0.0%	428

ALC: SA RCC: MATPEA QUARTER: 4 DATE: 21-AUG-90 TIME: 13:54:05 REPT.ID: VALID PAGE: 8

RESOURCE QUEUE STATISTICS

RESOURCE QUEUE	AVERAGE QUEUE QUANTITY	STANDARD DEVIATION	MAXIMUM QUEUE QUANTITY	AVERAGE QUEUE WAIT (hrs)	CURRENT QUEUE QUANTITY	THE BLAKE STATISTIC
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50002	EQ	0.00	0.01	26.00	0.00	9	0.00
50004	EQ	0.00	0.00	8.00	0.00	4	0.00
50005	EQ	0.00	0.03	7.00	0.00	0	0.00
50173	EQ	0.00	0.00	2.00	0.00	0	0.00
WG00	MP	1.88	2.66	14.00	1.75	1	3.30
WG09	MP	0.17	0.44	3.00	2.24	0	0.38
WG10	MP	1.62	2.42	15.00	1.39	3	2.26
WG11	MP	5.26	8.46	49.00	0.93	16	5.84
WGSW	MP	0.24	0.57	7.00	0.98	1	0.23

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 21-AUG-90 TIME: 13:54:05 REPT.ID: VALID PAGE: 9

ASSEMBLY STATISTICS

PARENT ITEM	TOTAL INDUCT	DELAYED OPERATIONS	WAIT (HOURS) AVERAGE	-----WAITING QUEUE COUNT-----		
				AVERAGE	STD.DEV.	MAXIMUM
AC/DB	828	124	51.1	0.7	0.8	4.0
F-15ST	406	356	68.8	2.8	1.9	10.0
F-16ST	458	490	63.3	3.5	2.0	10.0

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 21-AUG-90 TIME: 13:54:05 REPT.ID: VALID PAGE: 10

WORK IN PROCESS

ITEM	ALLOWABLE QUANTITY	AVERAGE	STD.DEV.	MINIMUM	MAXIMUM	CURRENT	AVERAGE		CURRENT	
							WAITING TIME	QUANTITY	WAITING TIME	QUANTITY
AC	99999	0.7	0.8	0	4	0	**	NONE	**	**
AC/DB	99999	3.9	2.1	0	12	3	**	NONE	**	**
DB	99999	0.0	0.2	0	2	0	**	NONE	**	**
F-15QT	99999	1.6	1.6	0	9	1	**	NONE	**	**
F-15SQT	99999	0.0	0.1	0	1	0	**	NONE	**	**
F-15ST	99999	166.6	18.2	140	199	192	**	NONE	**	**
F-16QT	99999	1.9	1.6	0	7	0	**	NONE	**	**
F-16SQT	99999	0.0	0.1	0	1	0	**	NONE	**	**
F-16ST	99999	208.6	19.7	165	241	218	**	NONE	**	**
GG	99999	2.4	1.8	0	10	5	**	NONE	**	**

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 21-AUG-90 TIME: 13:54:05 REPT.ID: VALID PAGE: 11

DEDICATED STOCK STATISTICS - Parallel Operations

STOCK ITEM TOTAL DELAYED WAIT -----WAITING QUEUE COUNT-----
 ----- INDUCT OPERATIONS (HOURS) AVERAGE AVERAGE STD.DEV. MAXIMUM CURRENT
 ----- ----- ----- ----- ----- ----- -----
 ALC: SA RCC: MATPFA QUARTER: 4 DATE: 21-AUG-90 TIME: 13:54:05 REPT.ID: VALID PAGE: 12

DEDICATED STOCK STATISTICS - Subcomponents

STOCK ITEM	TOTAL INDUCT	DELAYED OPERATIONS	WAIT (HOURS) AVERAGE	-----WAITING QUEUE COUNT-----		
				AVERAGE	STD.DEV.	MAXIMUM CURRENT
AC	415	418	0.7	0.0	0.2	3.0
AC/DB	828	829	0.0	0.0	0.0	1.0
DB	415	415	14.5	0.7	0.8	4.0
GG	830	828	0.0	0.0	0.0	1.0

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 21-AUG-90 TIME: 13:54:05 REPT.ID: VALID PAGE: 13

RESOURCE UTILIZATION by SHIFT

CODE	DESCRIPTION	SHIFT AVAIL.	NUMBER SHIFT UTIL.	-----AVERAGE NUMBER IN EACH STATE-----				-----BATCHING-----				
				IDLE	IN USE	PREV. MAINT.	FAILURE	OTHER DOWN	MIN SIZE	MAX SIZE	AVG SIZE	PAI
50002	50002	1	32.0	0.44	0.53	0.42	0.00	0.05	0.00			
		2	32.0	0.38	0.58	0.36	0.00	0.05	0.00			
		3	32.0	0.38	0.59	0.36	0.00	0.05	0.00			
		4	32.0	0.34	0.63	0.32	0.00	0.05	0.00			
		5	32.0	0.29	0.68	0.27	0.00	0.05	0.00			
		6	32.0	0.28	0.69	0.26	0.00	0.05	0.00			
50004	50004	1	9.8	0.17	0.80	0.17	0.00	0.03	0.00			
		2	9.8	0.15	0.83	0.15	0.00	0.03	0.00			
		3	9.8	0.07	0.90	0.07	0.00	0.03	0.00			
		4	9.8	0.18	0.79	0.18	0.00	0.03	0.00			
		5	9.8	0.18	0.79	0.17	0.00	0.03	0.00			
		6	9.8	0.15	0.82	0.15	0.00	0.03	0.00			
50005	50005	1	5.8	0.22	0.76	0.22	0.00	0.02	0.00			
		2	5.8	0.18	0.80	0.18	0.00	0.02	0.00			
		3	5.8	0.12	0.86	0.12	0.00	0.02	0.00			
		4	5.8	0.23	0.76	0.22	0.00	0.02	0.00			
		5	5.8	0.22	0.77	0.21	0.00	0.02	0.00			
		6	5.8	0.18	0.80	0.18	0.00	0.02	0.00			

080059

50173 J0173

1	16.5	0.01	0.98	0.01	0.00	0.00
2	16.5	0.01	0.99	0.01	0.00	0.00
3	16.5	0.01	0.99	0.01	0.00	0.00
4	16.5	0.01	0.99	0.01	0.00	0.00
5	16.5	0.00	1.00	0.00	0.00	0.00
6	16.5	0.01	0.99	0.01	0.00	0.00

WG00

1	37.0	0.15	0.49	0.09	0.00	0.43
2	10.0	0.49	0.30	0.28	0.00	0.43
3	9.0	0.45	0.31	0.26	0.00	0.43
4	14.0	0.31	0.40	0.18	0.00	0.43
5	16.0	0.24	0.44	0.14	0.00	0.43
6	8.0	0.43	0.33	0.25	0.00	0.43

WG09

1	4.0	0.10	0.58	0.06	0.00	0.36
2	2.5	0.15	0.55	0.10	0.00	0.36
3	1.0	0.32	0.44	0.21	0.00	0.36
4	2.0	0.16	0.54	0.11	0.00	0.36
5	0.0	NO VALUES RECORDED				
6	1.0	0.33	0.43	0.21	0.00	0.36

Note: Remember that the utilizations reflect
only 80% of the workload and the other
20% may not be spread evenly across all
resources.

ALC: SA RCC: MATFFA QUARTER: 4 DATE: 21-AUG-90 TIME: 13:54:05 REPT.ID: VALID PAGE: 14

RESOURCE UTILIZATION by SHIFT

CODE	DESCRIPTION	SHIFT	NUMBER AVAIL.	SHIFT UTIL.	AVERAGE NUMBER IN EACH STATE				BATCHING		
					PREV.	IN USE	FAILURE	OTHER DOWN	MIN SIZE	MAX SIZE	AVG SIZE
WG10	WG10	1	8.8	0.48	0.44	0.41	0.00	0.00	0.15		
		2	4.5	0.76	0.20	0.65	0.00	0.00	0.15		
		3	2.0	0.95	0.05	0.80	0.00	0.00	0.15		
		4	6.0	0.70	0.25	0.60	0.00	0.00	0.15		
		5	6.0	0.68	0.27	0.58	0.00	0.00	0.15		
		6	4.0	0.83	0.14	0.71	0.00	0.00	0.15		
WG11	WG11	1	21.0	0.68	0.27	0.58	0.00	0.00	0.15		
		2	14.3	0.87	0.11	0.74	0.00	0.00	0.15		
		3	14.3	0.88	0.10	0.75	0.00	0.00	0.15		
		4	11.0	0.97	0.03	0.82	0.00	0.00	0.15		
		5	9.0	0.99	0.01	0.84	0.00	0.00	0.15		
		6	9.0	0.98	0.02	0.83	0.00	0.00	0.15		

080960

203

WGSW	WGSW	1	2.0	0.35	0.37	0.20	0.00	0.00	0.43
		2	1.0	0.39	0.35	0.22	0.00	0.00	0.43
		3	1.0	0.29	0.41	0.17	0.00	0.00	0.43
		4	0.0	NO VALUES RECORDED					
		5	0.0	NO VALUES RECORDED					
		6	0.0	NO VALUES RECORDED					

Note: Remember that the utilizations reflect only 80% of the workload and the other 20% may not be spread evenly across all resources

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 21-AUG-90 TIME: 13:54:05 RPT.ID: VALID PAGE: 15

ITEM NAME: AC WCD NAME: SLOTHRU5

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL QTY	PROCESSED QTY	QUEUED QTY	QUEUED HRS	AVERAGE SCHEDULED HRS	AVERAGE SIMULATED HRS	DESC	RCC	OCC FAC
0100	113.	113.	1.	0.02	2.76	4.87	ASSY	MATPFA	1.00 WG00
0200	113.	113.	0.	0.00	5.69	9.96	REP	MATPFA	1.00
0300 S	114.	86.	20.	5.65	2.16	3.81	TEST	MATPFA	0.75 WG09,50173
0400	114.	90.	1.	4.69	4.11	6.41	TEST	MATPFA	0.75 WG09,50173
0500	114.	86.	8.	0.38	3.55	6.36	ASSY	MATPFA	0.75 WG00
0600 S	114.	114.	11.	5.84	2.12	3.53	TEST	MATPFA	1.00 WG09,50173
0700	115.	115.	0.	0.00	6.16	10.58	TEST	MATPFA	1.00
0800	115.	7.	0.	0.00	7.13	11.50	REP	MATPFA	0.10
0900 S	115.	15.	0.	0.00	2.56	4.70	TEST	MATPFA	0.10
1000	115.	14.	0.	0.00	10.18	19.99	TEST	MATPFA	0.10
1100	115.	115.	15.	0.64	3.27	5.82	ASSY	MATPFA	1.00 WG00
ALC: SA	RCC: MATPFA	QUARTER: 4	DATE: 21-AUG-90	TIME: 13:54:05	REPT.ID: VALID	PAGE: 16			

ITEM NAME: AC/DB WCD NAME: SLOTHRU4

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL QTY	PROCESSED QTY	QUEUED QTY	QUEUED HRS	AVERAGE SCHEDULED HRS	AVERAGE SIMULATED HRS	DESC	RCC	OCC FAC
0100	416.	416.	1.	0.59	2.59	4.35	REP	MATPFA	1.00 WG00

205

0200	416.	416.	0.	0.00	3.25	5.68	DSSY	MATPFA	1.00
0300	415.	415.	127.	50.49	3.54	6.07	ASSY	MATPFA	1.00
0400 S	418.	155.	67.	12.93	2.92	3.91	TEST	MATPFA	0.35
0500	419.	142.	35.	13.57	23.39	34.88	TEST	MATPFA	0.35
0600 S	419.	279.	64.	10.77	2.76	3.53	TEST	MATPFA	0.65
0700	419.	281.	16.	10.89	27.06	37.28	TEST	MATPFA	0.65
0800	417.	39.	11.	0.93	3.00	4.92	REP	MATPFA	0.10
0900 S	417.	134.	6.	13.30	2.58	3.76	TEST	ATPFA	0.30
1000	417.	7.	0.	0.00	27.37	36.29	TEST	MATPFA	0.03
1100 S	417.	28.	1.	1.46	2.28	3.29	TEST	MATPFA	0.07
1200	417.	23.	1.	9.82	22.54	34.52	TEST	MATPFA	0.07
ALC: SA	RCC: MATPFA	QUARTER: 4	DATE: 21-AUG-90	TIME: 13:54:05	REPT.ID: VALID	PAGE: 17			

ITEM NAME: DB WCD NAME: SLOTHRU6

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL QTY	PROCESSED QTY	QUEUED QTY	QUEUED HRS	AVERAGE SCHEDULED HRS	AVERAGE SIMULATED HRS	DESC	RCC	OCC FAC
0100	13.	13.	0.	0.00	2.81	5.16	REP	MATPFA	1.00
0200 S	13.	13.	2.	3.21	1.61	2.49	TEST	MATPFA	1.00
0300	13.	13.	0.	0.00	7.50	15.93	TEST	MATPFA	1.00
0400	13.	1.	1.	0.50	0.31	0.31	REP	MATPFA	0.05
0500 S	13.	1.	0.	0.00	0.96	0.96	TEST	MATPFA	0.05
0600	13.	2.	0.	0.00	6.15	9.55	TEST	MATPFA	0.05

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 21-AUG-90 TIME: 13:54:05 REPT.ID: VALID PAGE: 18

ITEM NAME: F-15QT WCD NAME: QUIKTHRU

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL QTY	PROCESSED QTY	QUEUED QTY	QUEUED HRS	AVERAGE SCHEDULED HRS	AVERAGE SIMULATED HRS	DESC	RCC	OCC FAC
0000	116.	116.	0.	0.00	2.00	2.00	IN	MATPFA	1.00
00100	116.	116.	116.	1.40	5.30	8.70	INSP	MATPFA	1.00
00200 S	116.	116.	67.	22.67	6.41	7.35	TEST	MATPFA	1.00
00300	116.	116.	0.	0.00	19.66	25.00	TEST	MATPFA	1.00
00400	117.	26.	0.	0.00	28.28	35.39	TEST	MATPFA	0.28
00500	117.	117.	0.	0.00	25.62	32.62	TEST	MATPFA	1.00

00100 116. 116. 116. 1.40 5.30 8.70 IN MATPFA 1.00 WG00
00200 S 116. 116. 67. 22.67 6.41 7.35 TEST MATPFA 1.00 WG11,50002
00300 116. 116. 0. 0.00 19.66 25.00 TEST MATPFA 1.00
00400 117. 26. 0. 0.00 28.28 35.39 TEST MATPFA 0.28
00500 117. 117. 0. 0.00 25.62 32.62 TEST MATPFA 1.00

0600 117. 117. 0. 0.00 10.33 12.58 MATPFA 1.00
0700 118. 118. 0. 0.00 1.37 1.59 MATPFA 1.00
0800 118. 118. 40. 1.23 2.94 4.78 PACK MATPFA 1.00 WGSW
9999 118. 118. 0. 0.00 4.00 4.00 OUT MATPFA 1.00
ALC: SA RCC: MATPFA QUARTER: 4 DATE: 21-AUG-90 TIME: 13:54:05 REPT.ID: VALID PAGE: 19

ITEM NAME: F-15SQT WCD NAME: SUPQTHRU

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL QTY	PROCESSED QTY	QUEUED QTY	QUEUED HRS	AVERAGE SCHEDULED HRS	AVERAGE SIMULATED HRS	DESC	RCC	OCC	FAC
0000	2.	2.	0.	0.00	2.00	2.00	IN	MATPFA	1.00	
0100	2.	2.	1.	23.73	5.30	5.30	INSP	MATPFA	1.00	WG11
0200 S	2.	2.	0.	0.00	6.32	8.12	TEST	MATPFA	1.00	
0300	2.	2.	0.	0.00	9.98	11.18	TEST	MATPFA	1.00	
0350	2.	2.	0.	0.00	4.16	4.77	TEST	MATPFA	1.00	
0400	2.	2.	0.	0.00	1.02	2.72	PACK	MATPFA	1.00	
9999	2.	2.	0.	0.00	4.00	4.00	OUT	MATPFA	1.00	

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 21-AUG-90 TIME: 13:54:05 REPT.ID: VALID PAGE: 20

ITEM NAME: F-15ST WCD NAME: SLOTHRUI

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL QTY	PROCESSED QTY	QUEUED QTY	QUEUED HRS	AVERAGE SCHEDULED HRS	AVERAGE SIMULATED HRS	DESC	RCC	OCC	FAC
0000	406.	406.	0.	0.00	101.23	100.93	IN	MATWIP	1.00	
0100	409.	409.	184.	1.73	5.30	8.94	INSP	MATPFA	1.00	WG00
0200 S	410.	278.	161.	20.40	5.21	6.06	TEST	MATPFA	0.70	WG11,50002
0300	411.	293.	63.	17.72	21.13	26.49	TEST	MATPFA	0.70	WG11,50002
0400	411.	411.	0.	0.00	1779.93	1799.65	WIP	WIP	1.00	

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 21-AUG-90 TIME: 13:54:05 REPT.ID: VALID PAGE: 21

ITEM NAME: F-15ST WCD NAME: AWP-G

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL PROCESSED		QUEUED QTY	QUEUED		AVERAGE SCHEDULED HRS	AVERAGE SIMULATED HRS	DESC		RCC		OCC	
	QTY	QTY		HRS	HRS			8DAY	AWP	MATPFA	G-COND	FAC	FAC
0050	163.	163.	0.	0.00	0.00	168.00	168.00	8DAY	AWP	MATPFA		1.00	1.00
0100	164.	38.	0.	0.00	0.00	1323.08	1327.52	AWP				0.28	0.28
0200	165.	120.	0.	0.00	0.00	5148.79	4675.90	GCON				0.72	0.72

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 21-AUG-90 TIME: 13:54:05 REPT.ID: VALID PAGE: 22

ITEM NAME: F-15ST WCD NAME: SLOTHRU0

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL PROCESSED		QUEUED QTY	QUEUED		AVERAGE SCHEDULED HRS	AVERAGE SIMULATED HRS	DESC		RCC		OCC	
	QTY	QTY		HRS	HRS			TEST	TEST	MATPFA	MATPFA	FAC	FAC
0300	271.	51.	38.	13.32	16.97	21.21	21.21	TEST	TEST	MATPFA		0.19	0.19
0400	271.	140.	75.	15.10	24.83	31.04	31.04	TEST	TEST	MATPFA		0.46	0.46
0500	271.	76.	18.	12.65	13.95	16.99	16.99	TEST	TEST	MATPFA		0.30	0.30

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 21-AUG-90 TIME: 13:54:05 REPT.ID: VALID PAGE: 23

ITEM NAME: F-15ST WCD NAME: SLOTHRU1

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL PROCESSED		QUEUED QTY	QUEUED HRS	AVERAGE SCHEDULED		AVERAGE SIMULATED HRS	DESC		RCC		OCC	
	QTY	QTY			HRS	HRS						FAC	FAC
0100	77.	77.	32.	1.33	1.39	1.96	1.96	REP	MATPFA	1.00	WG00		
0200 S	77.	77.	41.	17.59	6.94	7.85	7.85	TEST	MATPFA	1.00	WG11,50002		
0300	75.	52.	0	0.00	26.88	33.65	33.65	TEST	MATPFA	0.75			

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 21-AUG-90 TIME: 13:54:05 REPT.ID: VALID PAGE: 24

ITEM NAME: F-15ST WCD NAME: SLOTHRU7

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL QTY	PROCESSED QTY	QUEUED QTY	QUEUED HRS	AVERAGE SCHEDULED HRS	AVERAGE SIMULATED HRS	DESC	RCC	OCC FAC
0010	319.	319.	0.	0.00	0.00	0.00	DSSY	MATPFA	1.00 NR
0020	319	319.	159.	51.12	0.00	0.00	ASSY	MATPFA	1.00 NR,as
0050	319.	319.	123.	1.34	2.62	4.13	DSSY	MATPFA	1.00 WG00,50002
0100	319.	319.	164.	84.64	3.65	6.11	ASSY	MATPFA	1.00 WG00,50002,as
0200 S	322.	322.	165.	19.90	5.84	6.85	TEST	MATPFA	1.00 WG11,50002
0300	319.	319.	0.	0.00	27.10	34.00	TEST	MATPFA	1.00
0400	320.	320.	0.	0.00	14.41	17.28	TEST	MATPFA	1.00

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 21-AUG-90 TIME: 13:54:05 REPT.ID: VALID PAGE: 25

ITEM NAME: F-15ST WCD NAME: SLOTHRU7

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL QTY	PROCESSED QTY	QUEUED QTY	QUEUED HRS	AVERAGE SCHEDULED HRS	AVERAGE SIMULATED HRS	DESC	RCC	OCC FAC
0010	35.	35.	0.	0.00	0.00	0.00	DSSY	MATPFA	1.00 NR
0020	35.	35.	17.	44.66	0.00	0.00	ASSY	MATPFA	1.00 NR,as
0050	34.	34.	15.	1.03	2.68	4.20	DSSY	MATPFA	1.00 WG00,50002
0100	34.	34.	18.	99.68	3.73	5.93	ASSY	MATPFA	1.00 WG00,50002,as
0200 S	34.	34.	17.	17.50	6.83	8.01	TEST	MATPFA	1.00 WG11,50002
0300	34.	34.	0.	0.00	24.09	29.62	TEST	MATPFA	1.00
0400	34.	34.	0.	0.00	13.35	16.16	TEST	MATPFA	1.00

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 21-AUG-90 TIME: 13:54:05 REPT.ID: VALID PAGE: 26

ITEM NAME: F-15ST WCD NAME: SLOTHRU3

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL QTY	PROCESSED QTY	QUEUED QTY	QUEUED HRS	AVERAGE SCHEDULED HRS	AVERAGE SIMULATED HRS	DESC	RCC	OCC FAC
00100	395.	395.	208.	17.44	1.44	1.59	TEST	MATPFA	1.00 WG11,50002
00200	393.	393.	177.	1.16	2.49	3.86	PACK	MATPFA	1.00 WGSW

208

9999 393. 393. 0. 0.00 3.85 6.48 OUT MATPFA 1.00
ALC: SA RCC: MATPFA QUARTER: 4 DATE: 21-AUG-90 TIME: 13:54:05 REPT.ID: VALID PAGE: 27

ITEM NAME: F-16QT WCD NAME: QUIKTHRU

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL QTY	PROCESSED QTY	QUEUED QTY	QUEUED HRS	AVERAGE SCHEDULED HRS	AVERAGE SIMULATED HRS	DESC	RCC	OCC FAC
0000	129.	129.	0.	0.00	2.00	2.00	IN	MATPFA	1.00
0100	129.	129.	129.	1.40	5.30	8.70	INSP	MATPFA	1.00
0200 S	129.	129.	66.	19.26	4.68	5.38	TEST	MATPFA	1.00
0300	129.	129.	0.	0.00	20.96	25.81	TEST	MATPFA	1.00
0400	129.	34.	0.	0.00	25.31	31.88	TEST	MATPFA	0.28
0500	129.	129.	0.	0.00	34.14	43.32	TEST	MATPFA	1.00
0600	129.	129.	0.	0.00	14.07	16.96	TEST	MATPFA	1.00
0700	130.	130.	0.	0.00	1.46	1.71	TEST	MATPFA	1.00
0800	130.	130.	44.	1.09	2.62	3.93	PACK	MATPFA	1.00
9999	130.	130.	0.	0.00	4.00	4.00	OUT	MATPFA	1.00
ALC: SA	RCC: MATPFA	QUARTER: 4	DATE: 21-AUG-90	TIME: 13:54:05	REPT.ID: VALID	PAGE: 28			

ITEM NAME: F-16SQT WCD NAME: SUPQTHRU

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL QTY	PROCESSED QTY	QUEUED QTY	QUEUED HRS	AVERAGE SCHEDULED HRS	AVERAGE SIMULATED HRS	DESC	RCC	OCC FAC
0000	2.	2.	0.	0.00	2.00	2.00	IN	MATPFA	1.00
0100	2.	2.	0.	0.00	5.30	5.30	INSP	MATPFA	1.00
0200 S	2.	2.	0.	0.00	1.40	2.00	TEST	MATPFA	1.00
0300	2.	2.	0.	0.00	13.39	15.80	TEST	MATPFA	1.00
0350	2.	2.	0.	0.00	0.93	0.93	TEST	MATPFA	1.00
0400	2.	2.	0.	0.00	1.86	3.56	PACK	MATPFA	1.00
9999	2.	2.	0.	0.00	4.00	4.00	OUT	MATPFA	1.00
ALC: SA	RCC: MATPFA	QUARTER: 4	DATE: 21-AUG-90	TIME: 13:54:05	REPT.ID: VALID	PAGE: 29			

ITEM NAME: F-16ST WCD NAME: SLOTHRUI

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL QTY	PROCESSED QTY	QUEUED QTY	QUEUED HRS	AVERAGE SCHEDULED HRS	AVERAGE SIMULATED HRS	DESC	RCC	OCC FAC
0000	458.	458.	0.	0.00	99.65	101.40	IN	MATWIP	1.00
0100	463.	463.	212.	1.72	5.30	9.02	INSP	MATPFA	1.00
0200 S	464.	307.	173.	17.82	6.74	7.88	TEST	MATPFA	0.70
0300	464.	328.	57.	18.92	19.50	24.34	TEST	MATPFA	0.70
0400	464.	464.	0.	0.00	1871.71	1889.61	WIP	WIP	1.00

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 21-AUG-90 TIME: 13:54:05 REPT.ID: VALID PAGE: 30

ITEM NAME: F-16ST WCD NAME: AWP-G

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL QTY	PROCESSED QTY	QUEUED QTY	QUEUED HRS	AVERAGE SCHEDULED HRS	AVERAGE SIMULATED HRS	DESC	RCC	OCC FAC
0050	196.	196.	0.	0.00	168.00	168.00	8DAY	MATPFA	1.00
0100	195.	46.	0.	0.00	1466.12	1418.37	AWP	AWP	0.28
0200	191.	153.	0.	0.00	4978.88	4685.44	GCON	G-COND	0.72

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 21-AUG-90 TIME: 13:54:05 REPT.ID: VALID PAGE: 31

ITEM NAME: F-16ST WCD NAME: SLOTHRU0

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL QTY	PROCESSED QTY	QUEUED QTY	QUEUED HRS	AVERAGE SCHEDULED HRS	AVERAGE SIMULATED HRS	DESC	RCC	OCC FAC
0300	322.	63.	44.	15.77	21.54	26.42	TEST	MATPFA	0.19
0400	322.	157.	82.	17.66	28.71	35.64	TEST	MATPFA	0.46
0500	319.	92.	20.	16.49	15.10	18.40	TEST	MATPFA	0.30

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 21-AUG-90 TIME: 13:54:05 REPT.ID: VALID PAGE: 32

080067

ITEM NAME: F-16ST WCD NAME: SLOTHRU7

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL QTY	PROCESSED QTY	QUEUED QTY	QUEUED HRS	AVERAGE SCHEDULED HRS	AVERAGE SIMULATED HRS	DESC	RCC	OCC FAC
0010	434.	434.	0.	0.00	0.00	0.00	DSSY	MATPFA	1.00 NR
0020	434.	434.	230.	49.45	0.00	0.00	ASSY	MATPFA	1.00 NR,as
0050	434.	434.	145.	1.24	2.46	3.85	DSSY	MATPFA	1.00 WG00,50002
0100	434.	434.	216.	79.22	3.50	5.95	ASSY	MATPFA	1.00 WG00,50002,as
0200 S	433.	433.	244.	18.42	5.91	6.94	TEST	MATPFA	1.00 WG11,50002
0300	430.	430.	0.	0.00	27.29	34.83	TEST	MATPFA	1.00
0400	434.	434.	0.	0.00	13.50	16.34	TEST	MATPFA	1.00

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 21-AUG-90 TIME: 13:54:05 REPT.ID: VALID PAGE: 33

ITEM NAME: F-16ST WCD NAME: SLOTHRU7

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL QTY	PROCESSED QTY	QUEUED QTY	QUEUED HRS	AVERAGE SCHEDULED HRS	AVERAGE SIMULATED HRS	DESC	RCC	OCC FAC
0010	42.	42.	0.	0.00	0.00	0.00	DSSY	MATPFA	1.00 NR
0020	42.	42.	22.	38.04	0.00	0.00	ASSY	MATPFA	1.00 NR,as
0050	41.	41.	15.	1.13	2.65	3.97	DSSY	MATPFA	1.00 WG00,50002
0100	41.	41.	19.	75.12	3.58	5.65	ASSY	MATPFA	1.00 WG00,50002,as
0200 S	41.	41.	25.	26.89	5.91	6.99	TEST	MATPFA	1.00 WG11,50002
0300	41.	41.	0.	0.00	24.19	30.53	TEST	MATPFA	1.00
0400	41.	41.	0.	0.00	13.33	15.64	TEST	MATPFA	1.00

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 21-AUG-90 TIME: 13:54:05 REPT.ID: VALID PAGE: 34

ITEM NAME: F-16ST WCD NAME: SLOTHRU3

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL PROCESSED	QUEUED	QUEUED	AVERAGE SCHEDULED	AVERAGE SIMULATED	OCC
0010						
0020						
0050						
0100						
0200 S						
0300						
0400						

CODE	QTY	QTY	QTY	HRS	HRS	HRS	DESC	RCC	FAC
0100	432.	432.	235.	20.24	1.58	1.77	TEST	MATPFA	1.00
0200	427.	427.	189.	1.16	2.55	3.85	PACK	MATPFA	1.00
9999	427.	427.	0.	0.00	3.87	6.65	OUT	MATPFA	1.00

WG11,50002
WGSW

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 21-AUG-90 TIME: 13:54:05 REPT.ID: VALID PAGE: 35

ITEM NAME: GG WCD NAME: SLOTHRU2

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL QTY	PROCESSED QTY	QUEUED QTY	QUEUED HRS	AVERAGE SCHEDULED HRS	AVERAGE SIMULATED HRS	DESC	RCC	OCC FAC
0100	430.	430.	172.	1.33	3.63	5.78	REP	MATPFA	1.00
0200 S	431.	431.	191.	8.98	3.17	4.03	TEST	MATPFA	1.00
0300	430.	430.	0.	0.00	22.56	31.48	TEST	MATPFA	1.00
0400	428.	39.	15.	0.93	3.33	5.51	REP	MATPFA	0.10
0500 S	428.	47.	2.	6.01	2.22	2.65	TEST	MATPFA	0.10
0550	428.	38.	6.	14.99	21.07	28.97	TEST	MATPFA	0.10

WG00
WG10,50004
WG00
WG10,50004
WG10,50004

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 21-AUG-90 TIME: 13:54:05 REPT.ID: VALID PAGE: 36

BACKSHOP DWELL TIMES BY BACKSHOP RCC

ITEM	RCC	AVERAGE HOURS
AC	*** NO BACKSHOP ACTIVITY *****	
AC/DB	*** NO BACKSHOP ACTIVITY *****	
DB	*** NO BACKSHOP ACTIVITY *****	
F-15QT	*** NO BACKSHOP ACTIVITY *****	
F-15SQT	*** NO BACKSHOP ACTIVITY *****	

WIP 1799.65
AWP 307.60
G-COND 3400.65

08
08
08
08

F-16QT *** NO BACKSHOP ACTIVITY *****
 F-16SQT *** NO BACKSHOP ACTIVITY *****
 F-16ST WIP 1889.61
 F-16ST AWP 334.59
 F-16ST G-COND 3753.26
 GG *** NO BACKSHOP ACTIVITY *****

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 21-AUG-90 TIME: 13:54:05 REPT.ID: VALID PAGE: 37

HISTORICAL vs. SIMULATED COMPARISON

ITEM	HISTORICAL VALUES			SIMULATED VALUES			WORKLOAD WEIGHT	PERCENTAGE DIFFERENCE
	FLOWTIME HOURS	STANDARD DEVIATION	SAMPLE SIZE	FLOWTIME HOURS	STANDARD DEVIATION	SAMPLE SIZE		
AC	0.00	0.00	0	52.67	24.81	116	0.000	0.00
AC/DB	0.00	0.00	0	81.68	56.86	417	0.000	0.00
DB	0.00	0.00	0	25.69	23.84	13	0.000	0.00
F-15QT	0.00	0.00	0	121.08	53.46	118	0.000	0.00
F-15SQT	0.00	0.00	0	49.95	43.23	2	0.000	0.00
F-15ST	0.00	0.00	0	3359.05	2388.07	393	0.000	0.00
F-16QT	0.00	0.00	0	132.60	70.57	130	0.000	0.00
F-16SQT	0.00	0.00	0	33.59	20.33	2	0.000	0.00
F-16ST	0.00	0.00	0	3653.51	2470.83	427	0.000	0.00
GG	0.00	0.00	0	49.29	40.18	428	0.000	0.00

ITEM AC EXCLUDED FROM VALIDATION TEST DUE TO INSUFFICIENT DATA
 ITEM AC/DB EXCLUDED FROM VALIDATION TEST DUE TO INSUFFICIENT DATA
 ITEM DB EXCLUDED FROM VALIDATION TEST DUE TO INSUFFICIENT DATA
 ITEM F-15QT EXCLUDED FROM VALIDATION TEST DUE TO INSUFFICIENT DATA
 ITEM F-15SQT EXCLUDED FROM VALIDATION TEST DUE TO INSUFFICIENT DATA
 ITEM F-15ST EXCLUDED FROM VALIDATION TEST DUE TO INSUFFICIENT DATA
 ITEM F-16QT EXCLUDED FROM VALIDATION TEST DUE TO INSUFFICIENT DATA
 ITEM F-16SQT EXCLUDED FROM VALIDATION TEST DUE TO INSUFFICIENT DATA
 ITEM F-16ST EXCLUDED FROM VALIDATION TEST DUE TO INSUFFICIENT DATA

ITEM F-16ST EXCLUDED FROM VALIDATION TEST DUE TO INSUFFICIENT DATA

ITEM GG EXCLUDED FROM VALIDATION TEST DUE TO INSUFFICIENT DATA

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 21-AUG-90 TIME: 13:54:05 REPT.ID: VALID PAGE: 38

HISTORICAL vs. SIMULATED COMPARISON

NOT ENOUGH ITEMS REMAINING TO CONDUCT VALIDATION TEST

080071

214

215

MODEL RUN #3

080072

ITEM INDUCTIONS

	1ST QTR	2ND QTR	3RD QTR	4TH QTR	YTD
INDUCTIONS OF ITEM AC	99	106	88	128	421
INDUCTIONS OF ITEM AC/DB	213	203	191	248	855
INDUCTIONS OF ITEM DB	99	106	88	128	421
INDUCTIONS OF ITEM F-15QT	23	23	39	31	116
INDUCTIONS OF ITEM F-15SQT	1	0	1	0	2
INDUCTIONS OF ITEM F-15ST	80	81	136	109	406
INDUCTIONS OF ITEM F-16QT	41	17	40	31	129
INDUCTIONS OF ITEM F-16SQT	0	1	0	1	2
INDUCTIONS OF ITEM F-16ST	147	59	142	110	458
INDUCTIONS OF ITEM GG	209	204	192	252	857

TOTAL ITEM INDUCTIONS : 912 800 917 1038 3667

WCD INDUCTIONS

	1ST QTR	2ND QTR	3RD QTR	4TH QTR	YTD
INDUCTIONS OF WCD	36	29	34	39	138
INDUCTIONS OF WCD	99	106	88	130	423
INDUCTIONS OF WCD	0	4	4	1	9
INDUCTIONS OF WCD	23	23	39	31	116
INDUCTIONS OF WCD	1	0	1	0	2
INDUCTIONS OF WCD	80	81	136	109	406
INDUCTIONS OF WCD	43	18	38	46	145
INDUCTIONS OF WCD	75	51	63	70	259
INDUCTIONS OF WCD	16	18	27	24	85
INDUCTIONS OF WCD	87	63	73	91	314
INDUCTIONS OF WCD	8	10	9	12	39
INDUCTIONS OF WCD	103	86	85	111	385
INDUCTIONS OF WCD	41	17	40	31	129
INDUCTIONS OF WCD	0	1	0	1	2
INDUCTIONS OF WCD	147	59	142	110	458
INDUCTIONS OF WCD	46	59	40	43	188
INDUCTIONS OF WCD	74	91	65	89	319
INDUCTIONS OF WCD	105	120	99	131	455
INDUCTIONS OF WCD	9	11	11	18	49
INDUCTIONS OF WCD	105	126	87	129	447
INDUCTIONS OF WCD	119	103	90	141	453

TOTAL WCD INDUCTIONS : 1217 1076 1171 1357 4821

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 22-AUG-90 TIME: 14:42:14 REPT.ID: VALID PAGE: 4

FLOW CYCLE TIME STATISTICS

ITEM	HISTORICAL FLOWTIME HOURS	AVERAGE SIMULATED FLOW TIME HOURS	STANDARD DEVIATION	SIMULATED MINIMUM FLOW TIME HOURS	SIMULATED MAXIMUM FLOW TIME HOURS	NUMBER OF SAMPLES	NUMBER OF INDUCTIONS
AC	0.00	61.34	26.85	11.05	153.74	137	421
AC/DB	0.00	89.55	64.47	1.97	416.18	416	855
DB	0.00	18.89	11.91	6.63	44.72	9	421
F-15QT	0.00	129.67	59.67	34.80	313.22	115	116
F-15SQT	0.00	62.02	28.59	41.80	82.23	2	2
F-15ST	0.00	3123.34	2185.83	278.74	10853.97	381	406
F-16QT	0.00	124.43	55.05	47.53	327.75	129	129
F-16SQT	0.00	30.60	4.12	27.69	33.52	2	2
F-16ST	0.00	3487.84	2497.17	319.39	13022.61	441	458
GG	0.00	60.25	47.28	2.71	260.25	451	857
ALC: SA RCC: MATPFA QUARTER: 4 DATE: 22-AUG-90 TIME: 14:42:14 REPT.ID: VALID PAGE: 5							

DIRECT LABOR STATISTICS

ITEM	EXPECTED HOURS	STANDARD HOURS	SIMULATED AVERAGE LABOR HOURS	STANDARD DEVIATION	SIMULATED MINIMUM LABOR HOURS	SIMULATED MAXIMUM LABOR HOURS	NUMBER OF SAMPLES
AC	31.41	0.00	31.90	12.55	8.45	64.89	137
AC/DB	42.04	0.00	40.14	33.38	1.97	218.31	416
DB	10.19	0.00	8.43	5.25	2.91	19.72	9
F-15QT	83.56	0.00	82.02	38.19	21.59	214.28	115
F-15SQT	29.40	0.00	26.51	3.22	24.23	28.79	2
F-15ST	166.80	0.00	98.95	53.67	10.40	293.60	381
F-16QT	83.56	0.00	80.44	34.43	25.61	190.66	129
F-16SQT	29.40	0.00	20.65	4.61	17.39	23.91	2
F-16ST	159.30	0.00	105.43	50.51	24.00	349.41	441
GG	33.44	0.00	35.40	29.08	2.70	174.90	451
ALC: SA RCC: MATPFA QUARTER: 4 DATE: 22-AUG-90 TIME: 14:42:14 REPT.ID: VALID PAGE: 6							

BACKSHOP DWELL SUMMARY

21

ITEM	AVERAGE SIMULATED		SIMULATED		SIMULATED		NUMBER OF SAMPLES	
	BACKSHOP HOURS	STANDARD DEVIATION	MINIMUM BACKSHOP HOURS	MAXIMUM BACKSHOP HOURS	BACKSHOP HOURS	NUMBER OF SAMPLES		
AC	0.00	0.00	0.00	0.00	0.00	137		
AC/DB	0.00	0.00	0.00	0.00	0.00	416		
DB	0.00	0.00	0.00	0.00	0.00	9		
F-15QT	0.00	0.00	0.00	0.00	0.00	115		
F-15SQT	0.00	0.00	0.00	0.00	0.00	2		
F-15ST	2724.60	2146.87	0.00	10429.41	0.00	381		
F-16QT	0.00	0.00	0.00	0.00	0.00	129		
F-16SQT	0.00	0.00	0.00	0.00	0.00	2		
F-16ST	3067.81	2455.99	0.00	12484.44	0.00	441		
GG	0.00	0.00	0.00	0.00	0.00	451		
ALC: SA	RCC: MATPFA	QUARTER: 4	DATE: 22-AUG-90	TIME: 14:42:14	REPT.ID: VALID	PAGE: 7		

PROCESS TIMES SUMMARY

ITEM	HISTOR. FLOW		SIMULATED FLOW		WAITING FOR RESOURCES		PROCESSING FLOW		BACKSHOP		NUMBER OF SAMPLES
	HOURS		HOURS		HOURS	%	HOURS	%	HOURS	%	
AC	0.0		61.3		4.2	6.9%	57.1	93.1%	0.0	0.0%	137
AC/DB	0.0		89.6		27.9	31.1%	61.7	68.9%	0.0	0.0%	416
DB	0.0		18.9		1.2	6.2%	17.7	93.8%	0.0	0.0%	9
F-15QT	0.0		129.7		15.6	12.1%	114.0	87.9%	0.0	0.0%	115
F-15SQT	0.0		62.0		24.2	39.0%	37.8	61.0%	0.0	0.0%	2
F-15ST	0.0		3123.3		114.9	3.7%	283.9	9.1%	2724.6	87.2%	381
F-16QT	0.0		124.4		15.1	12.2%	109.3	87.8%	0.0	0.0%	129
F-16SQT	0.0		30.6		0.9	3.1%	29.7	96.9%	0.0	0.0%	2
F-16ST	0.0		3487.8		126.8	3.6%	293.2	8.4%	3067.8	88.0%	441
GG	0.0		60.3		8.9	14.8%	51.3	85.2%	0.0	0.0%	451
ALC: SA	RCC: MATPFA	QUARTER: 4	DATE: 22-AUG-90	TIME: 14:42:14	REPT.ID: VALID	PAGE: 8					

RESOURCE QUEUE STATISTICS

RESOURCE QUEUE	AVERAGE QUEUE QUANTITY	STANDARD DEVIATION	MAXIMUM QUEUE QUANTITY	AVERAGE QUEUE WAIT (hrs)	CURRENT QUEUE QUANTITY	THE BLAKE STATISTIC
08						
00						
00						
76						

50002	EQ	0.00	0.00	27.00	0.00	9	0.00
50004	EQ	0.00	0.00	7.00	0.00	1	0.00
50005	EQ	0.00	0.02	5.00	0.00	3	0.00
50173	EQ	0.00	0.00	4.00	0.00	1	0.00
WG00	MP	1.97	2.75	15.00	1.75	2	3.45
WG09	MP	0.29	0.69	5.00	2.36	0	0.68
WG10	MP	2.23	3.21	19.00	1.52	8	3.39
WG11	MP	7.98	9.75	45.00	0.95	18	7.55
WGSW	MP	0.24	0.58	8.00	0.93	1	0.22

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 22-AUG-90 TIME: 14:42:14 REPT.ID: VALID PAGE: 9

ASSEMBLY STATISTICS

PARENT ITEM	TOTAL INDUCT	DELAYED OPERATIONS	WAIT (HOURS) AVERAGE	-----WAITING QUEUE COUNT-----		
				AVERAGE	STD.DEV.	MAXIMUM
AC/DB	855	144	59.2	1.0	1.1	6.0
F-15ST	406	368	74.4	3.1	2.3	13.0
F-16ST	458	508	74.0	4.3	2.4	13.0

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 22-AUG-90 TIME: 14:42:14 REPT.ID: VALID PAGE: 10

WORK IN PROCESS

ITEM	ALLOWABLE QUANTITY	AVERAGE	STD DEV.	MINIMUM	MAXIMUM	CURRENT	AVERAGE		CURRENT	
							WAITING TIME	AVERAGE QUANTITY	WAITING TIME	CURRENT QUANTITY
AC	99999	1.0	1.1	0	6	1	**	NONE	WAITED	**
AC/DB	99999	4.3	2.5	0	14	9	**	NONE	WAITED	**
DB	99999	0.0	0.1	0	1	0	**	NONE	WAITED	**
F-15QT	99999	1.7	1.6	0	8	4	**	NONE	WAITED	**
F-15SQT	99999	0.0	0.1	0	1	0	**	NONE	WAITED	**
F-15ST	99999	161.1	19.0	132	195	187	**	NONE	WAITED	**
F-16QT	99999	1.8	1.5	0	6	0	**	NONE	WAITED	**
F-16SQT	99999	0.0	0.1	0	1	0	**	NONE	WAITED	**
F-16ST	99999	205.7	16.7	162	233	204	**	NONE	WAITED	**
GG	99999	3.1	2.2	0	12	6	**	NONE	WAITED	**

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 22-AUG-90 TIME: 14:42:14 REPT.ID: VALID PAGE: 11

DEDICATED STOCK STATISTICS - Parallel Operations

50173	50173	1	16.5	0.02	0.98	0.02	0.00	0.00	0.00	0.00
		2	16.5	0.02	0.98	0.02	0.00	0.00	0.00	0.00
		3	16.5	0.01	0.99	0.01	0.00	0.00	0.00	0.00
		4	16.5	0.02	0.98	0.02	0.00	0.00	0.00	0.00
		5	16.5	0.00	1.00	0.00	0.00	0.00	0.00	0.00
		6	16.5	0.02	0.98	0.02	0.00	0.00	0.00	0.00
WG00	WG00	1	37.0	0.15	0.49	0.09	0.00	0.00	0.43	0.43
		2	10.0	0.51	0.28	0.29	0.00	0.00	0.43	0.43
		3	9.0	0.47	0.31	0.27	0.00	0.00	0.43	0.43
		4	14.0	0.31	0.39	0.18	0.00	0.00	0.43	0.43
		5	16.0	0.26	0.42	0.15	0.00	0.00	0.43	0.43
		6	8.0	0.49	0.29	0.28	0.00	0.00	0.43	0.43
WG09	WG09	1	4.0	0.12	0.57	0.08	0.00	0.00	0.36	0.36
		2	2.5	0.17	0.54	0.11	0.00	0.00	0.36	0.36
		3	1.0	0.35	0.42	0.23	0.00	0.00	0.36	0.36
		4	2.0	0.27	0.47	0.17	0.00	0.00	0.36	0.36
		5	0.0	NO VALUES RECORDED						
		6	1.0	0.51	0.31	0.33	0.00	0.00	0.36	0.36

Note: Remember that the utilizations reflect only 80% of the workload and the other 20% may not be spread evenly across all resources.

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 22-AUG-90 TIME: 14:42:14 REPT.ID: VALID PAGE: 14

RESOURCE UTILIZATION b/ SHIFT

CODE	DESCRIPTION	SHIFT	NUMBER SHIFT AVAIL.	SHIFT UTIL.	AVERAGE NUMBER IN EACH STATE				OTHER DOWN	BATCHING			AVG SIZE	PAI
					IDLE	IN USE	PREV. MAINT.	FAILURE		MIN SIZE	MAX SIZE	AVG SIZE		
WG10	WG10	1	8.8	0.57	0.37	0.48	0.00	0.00	0.15					
		2	4.5	0.83	0.14	0.71	0.00	0.00	0.15					
		3	2.0	0.97	0.03	0.82	0.00	0.00	0.15					
		4	6.0	0.70	0.25	0.60	0.00	0.00	0.15					
		5	6.0	0.67	0.28	0.57	0.00	0.00	0.15					
		6	4.0	0.80	0.17	0.68	0.00	0.00	0.15					
WG11	WG11	1	21.0	0.70	0.25	0.60	0.00	0.00	0.15					
		2	14.3	0.86	0.12	0.73	0.00	0.00	0.15					
		3	14.3	0.87	0.11	0.74	0.00	0.00	0.15					
		4	11.0	0.93	0.06	0.79	0.00	0.00	0.15					
		5	9.0	0.96	0.03	0.82	0.00	0.00	0.15					
		6	9.0	0.95	0.04	0.81	0.00	0.00	0.15					

WGSW	WGSW	1	2.0	0.37	0.36	0.21	J.00	0.00	0.43
		2	1.0	0.38	0.36	0.22	0.00	0.00	0.43
		3	1.0	0.28	0.41	0.16	0.00	0.00	0.43
		4	0.0	NO VALUES RECORDED					
		5	0.0	NO VALUES RECORDED					
		6	0.0	NO VALUES RECORDED					

Note: Remember that the utilizations reflect only 80% of the workload and the other 20% may not be spread evenly across all resources

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 22-AUG-90 TIME: 14:42:14 REPT.ID: VALID PAGE: 15

ITEM NAME: AC WCD NAME: SLOTHRU5

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL QTY	PROCESSED QTY	QUEUED QTY	QUEUED HRS	AVERAGE SCHEDULED HRS	AVERAGE SIMULATED HRS	DESC	RCC	OCC FAC
0100	138.	138.	0.	0.00	3.27	5.61	ASSY	MATPFA	1.00
0200	138.	138.	0.	0.00	5.65	9.84	REP	MATPFA	1.00
0300 S	138.	114.	28.	7.37	1.98	3.67	TEST	MATPFA	0.75 WG09, 50173
0400	138.	108.	4.	11.68	4.39	7.98	TEST	MATPFA	0.75 WG09, 50173
0500	138.	102.	17.	0.45	4.16	7.16	ASSY	MATPFA	0.75 WG00
0600 S	138.	138.	32.	9.21	2.01	3.37	TEST	MATPFA	1.00 WG09, 50173
0700	137.	137.	0.	0.00	7.43	14.21	TEST	MATPFA	1.00
0800	137.	14.	1.	0.57	5.21	9.09	REP	MATPFA	0.10 WG00
0900 S	137.	10.	1.	14.43	3.06	4.63	TEST	MATPFA	0.10 WG09, 50173
1000	137.	17.	1.	3.99	8.77	18.24	TEST	MATPFA	0.10 WG09, 50173
1100	137.	137.	24.	0.46	3.49	5.85	ASSY	MATPFA	1.00 WG00

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 22-AUG-90 TIME: 14:42:14 REPT.ID: VALID PAGE: 16

ITEM NAME: AC/DB WCD NAME: SLOTHRU4

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL QTY	PROCESSED QTY	QUEUED QTY	QUEUED HRS	AVERAGE SCHEDULED HRS	AVERAGE SIMULATED HRS	DESC	RCC	OCC FAC
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0100	423.	423.	1.	0.09	2.71	4.54	REP	MATPFA	1.00	WG00
0200	422.	422.	0.	0.00	2.76	4.84	DSSY	MATPFA	1.00	
0300	421.	421.	143.	59.53	3.90	6.68	ASSY	MATPFA	1.00	WG00,as
0400 S	420.	420.	79.	11.06	2.48	3.26	TEST	MATPFA	0.35	WG10,50002
0500	419.	419.	55.	13.74	25.22	37.97	TEST	MATPFA	0.35	WG10,50002
0600 S	419.	419.	74.	14.69	2.87	3.74	TEST	MATPFA	0.65	WG10,50005
0700	419.	419.	21.	9.51	24.05	37.17	TEST	MATPFA	0.65	WG10,50005
0800	417.	417.	10.	1.06	2.48	3.91	REP	MATPFA	0.10	WG00
0900 S	417.	417.	7.	20.08	2.11	2.84	TEST	ATPFA	0.30	WG10,50002
1000	417.	417.	1.	18.30	26.21	43.13	TEST	MATPFA	0.03	WG10,50002
1100 S	417.	417.	3.	14.18	3.61	4.73	TEST	MATPFA	0.07	WG10,50005
1200	417.	417.	0.	0.00	25.51	36.41	TEST	MATPFA	0.07	
ALC: SA	RCC:	MATPFA	QUARTER: 4	DATE: 22-AUG-90	TIME: 14:42:14	REPT.ID: VALID	PAGE: 17			

ITEM NAME: DB WCD NAME: SLOTHRU6

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL QTY	PROCESSED QTY	QUEUED QTY	QUEUED HRS	AVERAGE SCHEDULED HRS	AVERAGE SIMULATED HRS	DESC	RCC	OCC FAC
0100	9.	9.	0.	0.00	2.10	3.61	REP	MATPFA	1.00
0200 S	9.	9.	3.	3.51	3.31	6.20	TEST	MATPFA	1.00
0300	9.	9.	0.	0.00	2.49	6.11	TEST	MATPFA	1.00
0400	9.	1.	0.	0.00	1.31	1.31	REP	MATPFA	0.05
0500 S	9.	1.	0.	0.00	3.47	14.87	TEST	MATPFA	0.05
0600	9.	0.	0.	0.00	0.00	0.00	TEST	MATPFA	0.05

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 22-AUG-90 TIME: 14:42:14 REPT.ID: VALID PAGE: 18

ITEM NAME: F-15QT WCD NAME: QUIKTHRU

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL QTY	PROCESSED QTY	QUEUED QTY	QUEUED HRS	AVERAGE SCHEDULED HRS	AVERAGE SIMULATED HRS	DESC	RCC	OCC FAC
0000	116.	116.	0.	0.00	2.00	2.00	IN	MATPFA	1.00
0100	116.	116.	116.	1.40	5.30	8.70	INSP	MATPFA	1.00
0200 S	116.	116.	69.	24.83	5:24	6.01	TEST	MATPFA	1.00
0300	115.	115.	0.	0.00	18.27	23.21	TEST	MATPFA	1.00
0400	116.	34.	0.	0.00	25.66	28.08	TEST	MATPFA	0.28

0500 114. 114. 0. 0.00 27.57 38.44 MATPFA 1.00
0600 114. 114. 0. 0.00 14.53 17.86 TEST MATPFA 1.00
0700 115. 115. 0. 0.00 1.52 1.77 TEST MATPFA 1.00
0800 115. 115. 39. 1.16 2.72 4.57 PACK MATPFA 1.00 WGSW
9999 115. 115. 0. 0.00 4.00 4.00 OUT MATPFA 1.00
ALC: SA RCC: MATPFA QUARTER: 4 DATE: 22-AUG-90 TIME: 14:42:14 REPT.ID: VALID PAGE: 19

ITEM NAME: F-15SQT WCD NAME: SUPQTHRU

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL QTY	PROCESSED QTY	QUEUED QTY	QUEUED HRS	AVERAGE SCHEDULED HRS	AVERAGE SIMULATED HRS	DESC	RCC	OCC FAC
0000	2.	2.	0.	0.00	2.00	2.00	IN	MATPFA	1.00
0100	2.	2.	1.	47.20	5.30	5.30	INSP	MATPFA	1.00 WGL1
0200 S	2.	2.	0.	0.00	5.05	6.25	TEST	MATPFA	1.00
0300	2.	2.	0.	0.00	12.59	15.00	TEST	MATPFA	1.00
0350	2.	2.	0.	0.00	0.79	0.79	TEST	MATPFA	1.00
0400	2.	2.	1.	1.20	2.78	4.48	PACK	MATPFA	1.00 WGSW
9999	2.	2.	0.	0.00	4.00	4.00	OUT	MATPFA	1.00

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 22-AUG-90 TIME: 14:42:14 REPT.ID: VALID PAGE: 20

ITEM NAME: F-15ST WCD NAME: SLOTHRUI

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL QTY	PROCESSED QTY	QUEUED QTY	QUEUED HRS	AVERAGE SCHEDULED HRS	AVERAGE SIMULATED HRS	DESC	RCC	OCC FAC
0000	406.	406.	0.	0.00	101.91	102.31	IN	MATWIP	1.00
0100	407.	407.	185.	1.85	5.30	8.95	INSP	MATPFA	1.00 WG00
0200 S	408.	283.	174.	27.77	6.21	7.21	TEST	MATPFA	0.70 WGL1,50002
0300	410.	273.	45.	23.78	21.09	26.58	TEST	MATPFA	0.70 WGL1,50002
0400	412.	412.	0.	0.00	1805.37	1797.47	WIP	WIP	1.00

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 22-AUG-90 TIME: 14:42:14 REPT.ID: VALID PAGE: 21

ITEM NAME: F-15ST WCD NAME: AWP-G

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL QTY	PROCESSED QTY	QUEUED QTY	QUEUED HRS	AVERAGE SCHEDULED HRS	AVERAGE SIMULATED HRS	DESC	RCC	OCC FAC
0050	145.	145.	0.	0.00	168.00	168.00	8DAY	MATPFA	1.00
0100	142.	49.	0.	0.00	1475.70	1484.47	AWP	AWP	0.28
0200	145.	102.	0.	0.00	4945.45	4580.06	GCON	G-COND	0.72

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 22-AUG-90 TIME: 14:42:14 REPT.ID: VALID PAGE: 22

ITEM NAME: F-15ST WCD NAME: SLOTHRU0

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL QTY	PROCESSED QTY	QUEUED QTY	QUEUED HRS	AVERAGE SCHEDULED HRS	AVERAGE SIMULATED HRS	DESC	RCC	OCC FAC
0300	259.	42.	24.	19.00	17.73	21.50	TEST	MATPFA	0.19
0400	258.	123.	65.	19.26	26.45	33.74	TEST	MATPFA	0.46
0500	259.	72.	15.	25.09	12.49	15.13	TEST	MATPFA	0.30

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 22-AUG-90 TIME: 14:42:14 REPT.ID: VALID PAGE: 23

ITEM NAME: F-15ST WCD NAME: SLOTHRU1

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL QTY	PROCESSED QTY	QUEUED QTY	QUEUED HRS	AVERAGE SCHEDULED HRS	AVERAGE SIMULATED HRS	DESC	RCC	OCC FAC
0100	85.	85.	33.	1.48	1.27	1.91	REP	MATPFA	1.00
0200 S	85.	85.	42.	24.19	5.98	6.97	TEST	MATPFA	1.00
0300	86.	70.	0.	0.00	27.80	35.98	TEST	MATPFA	0.75

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 22-AUG-90 TIME: 14:42:14 REPT.ID: VALID PAGE: 24

ITEM NAME: F-15ST WCD NAME: SLOTHRU7

227

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL QTY	PROCESSED QTY	QUEUED QTY	QUEUED HRS	AVERAGE SCHEDULED HRS	AVERAGE SIMULATED HRS	DESC	RCC	OCC FAC
0010	314.	314.	0.	0.00	0.00	0.00	DSSY	MATPFA	1.00 NR
0020	314.	314.	168.	63.04	0.00	0.00	ASSY	MATPFA	1.00 NR,as
0050	315.	315.	111.	1.32	2.40	3.68	DSSY	MATPFA	1.00 WG00,50002
0100	315.	315.	153.	86.71	4.20	7.16	ASSY	MATPFA	1.00 WG00,50002,as
0200 S	312.	312.	186.	22.87	6.20	7.20	TEST	MATPFA	1.00 WG11,50002
0300	310.	310.	0.	0.00	25.43	32.90	TEST	MATPFA	1.00
0400	311.	311.	0.	0.00	13.59	16.90	TEST	MATPFA	1.00

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 22-AUG-90 TIME: 14:42:14 REPT.ID: VALID PAGE: 25

ITEM NAME: F-15ST WCD NAME: SLOTHRU7

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL QTY	PROCESSED QTY	QUEUED QTY	QUEUED HRS	AVERAGE SCHEDULED HRS	AVERAGE SIMULATED HRS	DESC	RCC	OCC FAC
0010	39.	39.	0.	0.00	0.00	0.00	DSSY	MATPFA	1.00 NR
0020	39.	39.	23.	64.38	0.00	0.00	ASSY	MATPFA	1.00 NR,as
0050	39.	39.	12.	1.34	2.04	3.08	DSSY	MATPFA	1.00 WG00,50002
0100	39.	39.	22.	92.65	4.19	7.07	ASSY	MATPFA	1.00 WG00,50002,as
0200 S	39.	39.	20.	23.80	5.50	6.33	TEST	MATPFA	1.00 WG11,50002
0300	39.	39.	0.	0.00	29.51	36.34	TEST	MATPFA	1.00
0400	38.	38.	0.	0.00	12.12	14.43	TEST	MATPFA	1.00

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 22-AUG-90 TIME: 14:42:14 REPT.ID: VALID PAGE: 26

ITEM NAME: F-15ST WCD NAME: SLOTHRU3

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL QTY	PROCESSED QTY	QUEUED QTY	QUEUED HRS	AVERAGE SCHEDULED HRS	AVERAGE SIMULATED HRS	DESC	RCC	OCC FAC
00100	385.	385.	228.	24.35	1.48	1.66	TEST	MATPFA	1.00 WG11,50002

84

0200 381. 381. 171. 1.24 2.60 3.97 1.00 WGSW
9999 381. 381. 0. 0.00 3.95 6.72 1.00
ALC: SA RCC: MATPFA QUARTER: 4 DATE: 22-AUG-90 TIME: 14:42:14 REPT.ID: VALID PAGE: 27

ITEM NAME: F-16QT WCD NAME: QUIKTHRU

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL PROCESSED		QUEUED		AVERAGE SCHEDULED		AVERAGE SIMULATED		OCC	
	QTY	QTY	QTY	HRS	HRS	HRS	HRS	DESC	RCC	FAC
0000	129.	129.	0.	0.00	2.00	2.00	2.00	IN	MATPFA	1.00
0100	129.	129.	129.	1.40	5.30	8.70	8.70	INSP	MATPFA	1.00
0200 S	129.	129.	88.	19.62	5.99	6.95	6.95	TEST	MATPFA	1.00
0300	129.	129.	0.	0.00	20.59	25.17	25.17	TEST	MATPFA	1.00
0400	129.	32.	0.	0.00	24.59	31.64	31.64	TEST	MATPFA	0.28
0500	129.	129.	0.	0.00	24.98	32.33	32.33	TEST	MATPFA	1.00
0600	129.	129.	0.	0.00	13.40	16.22	16.22	TEST	MATPFA	1.00
0700	129.	129.	0.	0.00	1.42	1.69	1.69	TEST	MATPFA	1.00
0800	129.	129.	43.	1.04	2.66	4.39	4.39	PACK	MATPFA	1.00
9999	129.	129.	0.	0.00	4.00	4.00	4.00	OUT	MATPFA	1.00
ALC: SA	RCC: MATPFA	QUARTER: 4	DATE: 22-AUG-90	TIME: 14:42:14	REPT.ID: VALID	PAGE: 28				

ITEM NAME: F-16SQT WCD NAME: SUPQTHRU

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL PROCESSED		QUEUED		AVERAGE SCHEDULED		AVERAGE SIMULATED		OCC	
	QTY	QTY	QTY	HRS	HRS	HRS	HRS	DESC	RCC	FAC
0000	2.	2.	0.	0.00	2.00	2.00	2.00	IN	MATPFA	1.00
0100	2.	2.	0.	0.00	5.30	5.30	5.30	INSP	MATPFA	1.00
0200 S	2.	2.	0.	0.00	1.13	2.33	2.33	TEST	MATPFA	1.00
0300	2.	2.	0.	0.00	10.20	11.40	11.40	TEST	MATPFA	1.00
0350	2.	2.	0.	0.00	1.34	1.94	1.94	TEST	MATPFA	1.00
0400	2.	2.	1.	1.89	2.68	2.68	2.68	PACK	MATPFA	1.00
9999	2.	2.	0.	0.00	4.00	4.00	4.00	OUT	MATPFA	1.00
ALC: SA	RCC: MATPFA	QUARTER: 4	DATE: 22-AUG-90	TIME: 14:42:14	REPT.ID: VALID	PAGE: 29				

ITEM NAME: F-16ST WCD NAME: SLOTHRUI

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL QTY	PROCESSED QTY	QUEUED QTY	QUEUED HRS	AVERAGE SCHEDULED HRS	AVERAGE SIMULATED HRS	DESC	RCC	OCC FAC
0000	458.	458.	0.	0.00	100.14	99.16	IN	MATWIP	1.00
0100	459.	459.	209.	1.62	5.30	9.03	INSP	MATPFA	1.00
0200 S	460.	326.	209.	25.40	5.79	6.75	TEST	MATPFA	0.70
0300	462.	324.	51.	28.35	22.71	28.69	TEST	MATPFA	0.70
0400	461.	461.	0.	0.00	1843.07	1862.67	WIP	WIP	1.00

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 22-AUG-90 TIME: 14:42:14 REPT.ID: VALID PAGE: 30

ITEM NAME: F-16ST WCD NAME: AWP-G

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL QTY	PROCESSED QTY	QUEUED QTY	QUEUED HRS	AVERAGE SCHEDULED HRS	AVERAGE SIMULATED HRS	DESC	RCC	OCC FAC
0050	188.	188.	0.	0.00	168.00	168.00	8DAY	MATPFA	1.00
0100	187.	47.	0.	0.00	1380.08	1381.51	AWP	AWP	0.28
0200	187.	134.	0.	0.00	5013.41	4932.42	GCON	G-COND	0.72

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 22-AUG-90 TIME: 14:42:14 REPT.ID: VALID PAGE: 31

ITEM NAME: F-16ST WCD NAME: SLOTHRU0

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL QTY	PROCESSED QTY	QUEUED QTY	QUEUED HRS	AVERAGE SCHEDULED HRS	AVERAGE SIMULATED HRS	DESC	RCC	OCC FAC
0300	319.	56.	41.	24.06	20.46	25.01	TEST	MATPFA	0.19
0400	318.	143.	66.	20.59	28.33	36.60	TEST	MATPFA	0.46
0500	318.	89.	35.	23.32	13.93	17.01	TEST	MATPFA	0.30

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 22-AUG-90 TIME: 14:42:14 REPT.ID: VALID PAGE: 32

OPER CODE	POTENTIAL PROCESSED		QUEUED QTY	QUEUED		SCHEDULED		SIMULATED		DESC	RCC	OCC FAC
	QTY	QTY		HRS	HRS	HRS	HRS					
0100	447.	447.	245.	26.73	1.52	1.74		TEST	MATPFA	1.00	WG11, 50002	
0200	442.	442.	209.	1.31	2.43	3.64		PACK	MATPFA	1.00	WGSW	
9999	442.	442.	0.	0.00	3.84	6.54		OUT	MATPFA	1.00		
ALC: SA RCC: MATPFA QUARTER: 4 DATE: 22-AUG-90 TIME: 14:42:14 REPT.ID: VALID PAGE: 35												

ITEM NAME: GG
WCD NAME: SLOTHRU2

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL		PROCESSED		QUEUED QTY	QUEUED HRS	AVERAGE SCHEDULED HRS	AVERAGE SIMULATED HRS	DESC	RCC	OCC	
	QTY		QTY								FAC	
0100	453.		453.		191.	1.41	3.58	5.70	REP	MATPFA	1.00	WG00
0200 S	453.		453.		242.	15.45	2.92	3.57	TEST	MATPFA	1.00	WG10, 50004
0300	451.		451.		0.	0.00	25.54	37.55	TEST	MATPFA	1.00	
0400	451.		45.		12.	1.02	3.20	5.39	REP	MATPFA	0.10	WG00
0500 S	451.		43.		4.	32.47	3.30	3.76	TEST	MATPFA	0.10	WG10, 50004
0550	451.		41.		0.	0.00	26.16	39.03	TEST	MATPFA	0.10	

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 22-AUG-90 TIME: 14:42:14 REPT.ID: VALID PAGE: 36

BACKSHOP DWELL TIMES BY BACKSHOP RCC

ITEM	RCC	AVERAGE HOURS
AC	*** NO BACKSHOP ACTIVITY	*****
AC/DB	*** NO BACKSHOP ACTIVITY	*****
DB	*** NO BACKSHOP ACTIVITY	*****
F-15QT	*** NO BACKSHOP ACTIVITY	*****
F-15SQT	*** NO BACKSHOP ACTIVITY	*****

00F-1550T

8

CONFIDENTIAL

ISST-30

WIP	1797.47
AWP	512.25

F-15ST G-COND 3221.83

F-16QT *** NO BACKSHOP ACTIVITY *****

F-16SQT *** NO BACKSHOP ACTIVITY *****

F-16ST WIP 1862.67

F-16ST AWP 347.22

F-16ST G-COND 3534.46

GG *** NO BACKSHOP ACTIVITY *****

ALC: SA RCC: MATPPA QUARTER: 4 DATE: 22-AUG-90 TIME: 14:42:14 REPT.ID: VALID PAGE: 37

HISTORICAL vs. SIMULATED COMPARISON

ITEM	HISTORICAL VALUES			SIMULATED VALUES			PERCENTAGE	
	FLOWTIME HOURS	STANDARD DEVIATION	SAMPLE SIZE	FLOWTIME HOURS	STANDARD DEVIATION	SAMPLE SIZE	WORKLOAD WEIGHT	DIFFERENCE
AC	0.00	0.00	0	61.34	26.85	137	0.000	0.00
AC/DB	0.00	0.00	0	89.55	64.47	416	0.000	0.00
DB	0.00	0.00	0	18.89	11.91	9	0.000	0.00
F-15QT	0.00	0.00	0	129.67	59.67	115	0.000	0.00
F-15SQT	0.00	0.00	0	62.02	28.59	2	0.000	0.00
F-15ST	0.00	0.00	0	3123.34	2185.83	381	0.000	0.00
F-16QT	0.00	0.00	0	124.43	55.05	129	0.000	0.00
F-16SQT	0.00	0.00	0	30.60	4.12	2	0.000	0.00
F-16ST	0.00	0.00	0	3487.84	2497.17	441	0.000	0.00
GG	0.00	0.00	0	60.25	47.28	451	0.000	0.00

ITEM AC EXCLUDED FROM VALIDATION TEST DUE TO INSUFFICIENT DATA

ITEM AC/DB EXCLUDED FROM VALIDATION TEST DUE TO INSUFFICIENT DATA

ITEM DB EXCLUDED FROM VALIDATION TEST DUE TO INSUFFICIENT DATA

ITEM F-15QT EXCLUDED FROM VALIDATION TEST DUE TO INSUFFICIENT DATA

ITEM F-15SQT EXCLUDED FROM VALIDATION TEST DUE TO INSUFFICIENT DATA

ITEM F-15ST EXCLUDED FROM VALIDATION TEST DUE TO INSUFFICIENT DATA

ITEM F-16QT EXCLUDED FROM VALIDATION TEST DUE TO INSUFFICIENT DATA

080090

ITEM F-16SQT EXCLUDED FROM VALIDATION TEST DUE TO INSUFFICIENT DATA PAGE: 38
ITEM F-16ST EXCLUDED FROM VALIDATION TEST DUE TO INSUFFICIENT DATA
ITEM GG EXCLUDED FROM VALIDATION TEST DUE TO INSUFFICIENT DATA
ALC: SA RCC: MATPFA QUARTER: 4 DATE: 22-AUG-90 TIME: 14:42:14 REPT.ID: VALID PAGE: 38

HISTORICAL vs. SIMULATED COMPARISON

NOT ENOUGH ITEMS REMAINING TO CONDUCT VALIDATION TEST

WORK LOAD FILE

** UFC WORK LOAD VALIDATION FILE **

AC	SLOTHRU5	4					0.31		S	1A B
AC/DB	SLOTHRU4	4					0.50		S	1A B
DB	SLOTHRU6	4					0.03		S	1A B
F-15QT	QUIKTHRU	4	23	23	39	31	1.00			1A B
F-15SQT	SUPQTHRU	4	1	0	1	0	1.00	367		1A B
F-15ST	SLOTHRUI	4	80	81	136	109	1.00			1A B
F-15ST	AWP-G						0.38			
F-15ST	SLOTHRU0						0.70			
F-15ST	SLOTHRU1						0.20			
F-15ST	SLOTHRU7						0.80			
F-15ST	SLOTHRU7						0.10			
F-15ST	SLOTHRU3						1.00			
F-16QT	QUIKTHRU	4	41	17	40	31	1.00			1A B
F-16SQT	SUPQTHRU	4	0	1	0	1	1.00	367		1A B
F-16ST	SLOTHRUI	4	147	59	142	110	1.00			1A B
F-16ST	AWP-G						0.38			
F-16ST	SLOTHRU0						0.70			
F-16ST	SLOTHRU7						1.00			
F-16ST	SLOTHRU7						0.10			
F-16ST	SLOTHRU3						1.00			
GG	SLOTHRU2	4					0.50		S	1A B

RESOURCE FILE

** UFC RESOURCE VALIDATION FILE **

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**
EQ 50002    1  32 32 32 32 32 32 32 32 32 32 .00 .00 .00 .00 .00 .00 .00 .00
EQ 50002    2  32 32 32 32 32 32 32 32 32 32 .00 .00 .00 .00 .00 .00 .00 .00
EQ 50002    3  32 32 32 32 32 32 32 32 32 32 .00 .00 .00 .00 .00 .00 .00 .00
EQ 50002    4  32 32 32 32 32 32 32 32 32 32 .00 .00 .00 .00 .00 .00 .00 .00
RN          50002
BZ          1    1
BF          E    0.75
TR          E    0.90
EQ 50004    1  10 10 10 10 10 10 10 10 10 10 .00 .00 .00 .00 .00 .00 .00 .00
EQ 50004    2  10 10 10 10 10 10 10 10 10 10 .00 .00 .00 .00 .00 .00 .00 .00
EQ 50004    3  10 10 10 10 10 10 10 10 10 10 .00 .00 .00 .00 .00 .00 .00 .00
EQ 50004    4   9  9  9  9  9  9  9  9  9  9 .00 .00 .00 .00 .00 .00 .00 .00
RN          50004
BZ          1    1
BF          E    1.50
TR          E    1.00
EQ 50005    1   6  6  6  6  6  6  6  6  6  6 .00 .00 .00 .00 .00 .00 .00 .00
EQ 50005    2   6  6  6  6  6  6  6  6  6  6 .00 .00 .00 .00 .00 .00 .00 .00
EQ 50005    3   6  6  6  6  6  6  6  6  6  6 .00 .00 .00 .00 .00 .00 .00 .00
EQ 50005    4   5  5  5  5  5  5  5  5  5  5 .00 .00 .00 .00 .00 .00 .00 .00
RN          50005
BZ          1    1
BF          E    2.00
TR          E    1.00
EQ 50173    1  17 17 17 17 17 17 17 17 17 17 .00 .00 .00 .00 .00 .00 .00 .00
EQ 50173    2  17 17 17 17 17 17 17 17 17 17 .00 .00 .00 .00 .00 .00 .00 .00
EQ 50173    3  16 16 16 16 16 16 16 16 16 16 .00 .00 .00 .00 .00 .00 .00 .00
EQ 50173    4  16 16 16 16 16 16 16 16 16 16 .00 .00 .00 .00 .00 .00 .00 .00
RN          50173
BZ          1    1
BF          E    19.0
TR          E    0.58
MP WG00     1  37 10  9 14 16  8  0  0  04.604.604.604.604.604.600.000.000.00
MP WG00     2  37 10  9 14 16  8  0  0  04.604.604.604.604.604.600.000.000.00
MP WG00     3  37 10  9 14 16  8  0  0  04.604.604.604.604.604.600.000.000.00
MP WG00     4  37 10  9 14 16  8  0  0  04.604.604.604.604.604.600.000.000.00
RN          WG00
MP WG09     1   4  2  1  2  0  1  0  0 05.475.475.475.475.475.470.000.000.00
MP WG09     2   4  2  1  2  0  1  0  0 05.405.405.405.405.405.400.000.000.00
MP WG09     3   4  2  1  2  0  1  0  0 04.604.604.604.604.604.600.000.000.00
MP WG09     4   4  4  1  2  0  1  0  0 05.165.165.165.165.165.160.000.000.00
RN          WG09
MP WG10     1   9  5  2  6  6  4  0  0 06.806.806.806.806.806.800.000.000.00
MP WG10     2   9  5  2  6  6  4  0  0 06.806.806.806.806.806.800.000.000.00
MP WG10     3   8  4  2  6  6  4  0  0 06.806.806.806.806.806.800.000.000.00
MP WG10     4   9  4  2  6  6  4  0  0 06.806.806.806.806.806.800.000.000.00
RN          WG10
MP WG11     1  22 15 15 11  9  9  0  0 06.806.806.806.806.806.800.000.000.00
MP WG11     2  22 15 15 11  9  9  0  0 06.806.806.806.806.806.800.000.000.00
MP WG11     3  19 13 13 11  9  9  0  0 06.806.806.806.806.806.800.000.000.00
MP WG11     4  21 14 14 11  9  9  0  0 06.806.806.806.806.806.800.000.000.00
RN          WG11
MP WGSW     1   2  1  1  0  0  0  0  0 04.604.604.600.000.000.000.000.000.00
MP WGSW     2   2  1  1  0  0  0  0  0 04.604.604.600.000.000.000.000.000.00
MP WGSW     3   2  1  1  0  0  0  0  0 04.604.604.600.000.000.000.000.000.00
MP WGSW     4   2  1  1  0  0  0  0  0 04.604.604.600.000.000.000.000.000.00
RN          WGSW
AR          WG00

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OPERATION FILE

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** ***** MATPFA SAN ANTONIO AUGUST 1990 *****
** ***** QUIKTHRU *****
OD      QUIKTHRU0000 IN  P      1.00 MATPFA
MF      C      2.00
NR
OD      QUIKTHRU0100 INSP P      1.00 MATPFA
MP      WG00      1C      5.30
OD      QUIKTHRU0200 TEST S      1.00 MATPFA
MP      WG11      1E      6.00      6.00      12.00
EQ      50002      1S      6.00      6.00      12.00
OD      QUIKTHRU0300 TEST P      1.00 MATPFA
MP      WG11      1E      21.00      21.00      34.00
EQ      50002      1S      21.00      21.00      34.00
OD      QUIKTHRU0400 TEST P      0.28 MATPFA
MP      WG11      1E      22.00      22.00      36.00
EQ      50002      1S      22.00      22.00      36.00
OD      QUIKTHRU0500 TEST P      1.00 MATPFA
MP      WG11      1E      27.00      27.00      72.00
EQ      50002      1S
OD      QUIKTHRU0600 TEST P      1.00 MATPFA
MP      WG11      1E      14.00      14.00      36.00
EQ      50002      1S      14.00      14.00      36.00
OD      QUIKTHRU0700 TEST P      1.00 MATPFA
MP      WG11      1E      1.50      1.50      5.00
EQ      50002      1S      1.50      1.50      5.00
OD      QUIKTHRU0800 PACK P      1.00 MATPFA
MP      WGSW      1E      2.60      2.60      6.60
OD      QUIKTHRU9999 OUT  P      1.00 MATPFA
MF      1C      4.00
NR
** ***** SLOTHRU *****
OD      SLOTHRU00300 TEST P      0.19 MATPFA
MP      WG11      1E      22.00      22.00      36.00
EQ      50002      1S      22.00      22.00      36.00
OD      SLOTHRU00400 TEST P      0.46 MATPFA
MP      WG11      1E      27.00      27.00      72.00
EQ      50002      1S      27.00      27.00      72.00
OD      SLOTHRU00500 TEST P      0.30 MATPFA
MP      WG11      1E      14.00      14.00      36.00
EQ      50002      1S      14.00      14.00      36.00
** ***** SLOTHRU1 *****
OD      SLOTHRU10100 REP  P      1.00 MATPFA
MP      WG00      1E      1.50      2.00      2.90
OD      SLOTHRU10200 TEST S      1.00 MATPFA
MP      WG11      1E      6.00      6.00      12.00
EQ      50002      1S      6.00      6.00      12.00
OD      SLOTHRU10300 TEST P      0.75 MATPFA
EQ      WG11      1E      27.00      27.00      72.00
FQ      50002      1S      27.00      27.00      72.00
** ***** SLOTHRU2 *****
OD      SLOTHRU20100 REP  P      1.00 MATPFA
MP      WG00      1E      3.40      3.40      5.20
OD      SLOTHRU20200 TEST S      1.00 MATPFA
MP      WG10      1E      3.00      3.00      16.00
EQ      50004      1S      3.00      3.00      16.00
OD      SLOTHRU20300 TEST P      1.00 MATPFA
MP      WG10      1E      24.00      24.00      70.00
EQ      50004      1S      24.00      24.00      70.00
OD      SLOTHRU20400 REP  P      0.10 MATPFA
MP      WG00      1E      3.40      3.40      5.20
OD      SLOTHRU20500 TEST S      0.10 MATPFA
MP      WG10      1E      3.00      3.00      16.00
EQ      50004      1S      3.00      3.00      16.00
OD      SLOTHRU20550 TEST P      0.10 MATPFA

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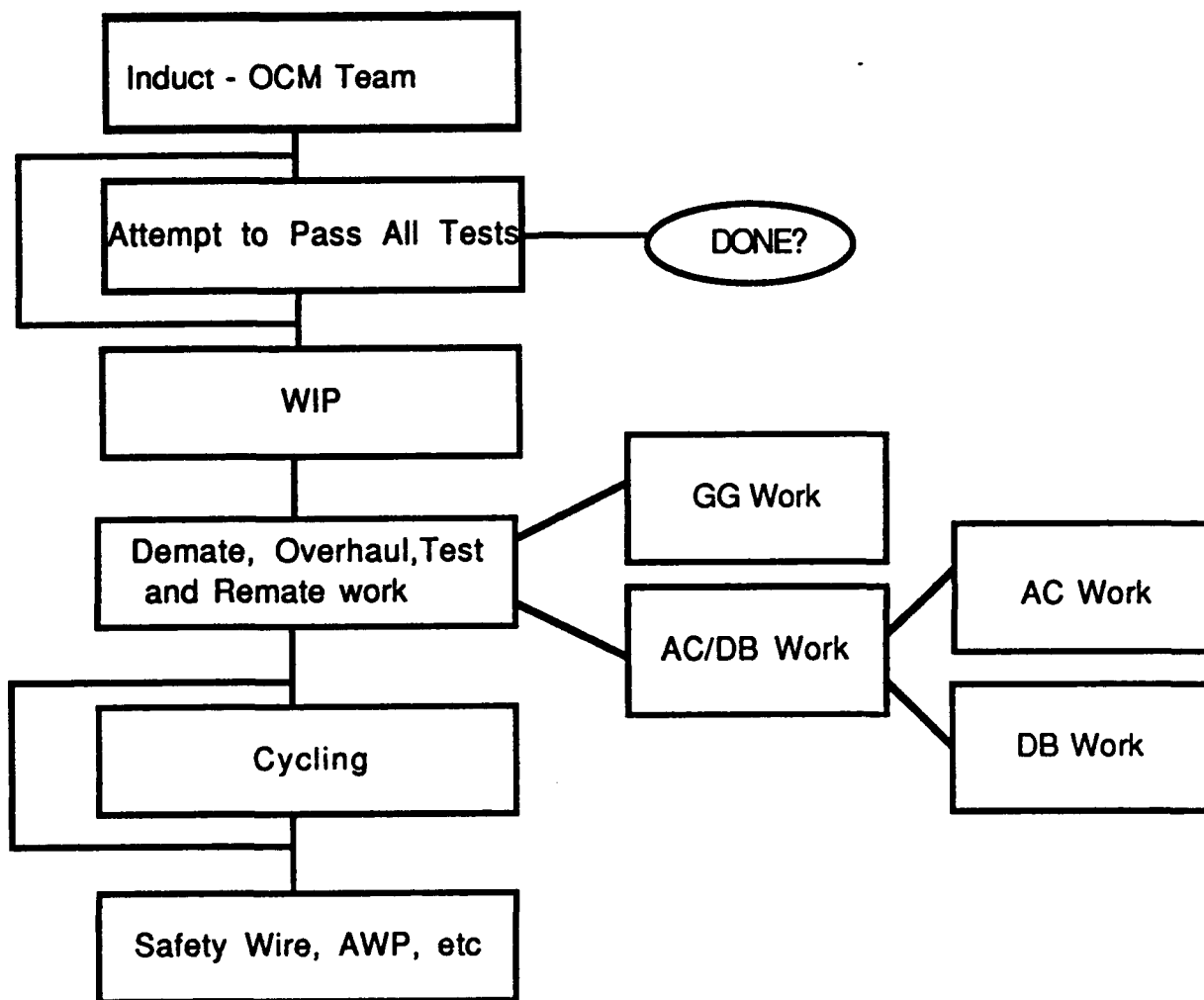
MP	WG10	1E	24.00	24.00	70.00
EQ	50004	1S	24.00	24.00	70.00
OD		SLOTHRU30100	TEST P		1.00 MATPFA
MP	WG11	1E	1.50	1.50	5.00
EQ	50002	1S	1.50	1.50	5.00
OD		SLOTHRU30200	PACK P		1.00 MATPFA
MP	WGSW	1E	2.60	2.60	6.60
OD		SLOTHRU39999	OUT P		1.00 MATPFA
MP	WGSW	1E	4.00		
** represents parts that spend time AWP *****					
OD		AWP-G	0050 8DAY P		1.00 MATPFA
MF		1C	168.0		
NR					
OD		AWP-G	0100 AWP P		0.28 AWP
BS		1N	1368.0 400.0		
NR					
OD		AWP-G	0200 GCON P		0.72 G-COND
BS		1N	4896.0 1500.0		
NR					
** ***** SLOTHRU4 *****					
OD		SLOTHRU40100	REP P		1.00 MATPFA
MP	WG00	1E	2.70	2.70	14.90
OD		SLOTHRU40200	DSSY P		1.00 MATPFA
MP	WG00	1E	3.10	3.10	6.00
DS	AC		Y		
DS	DB		Y		
OD		SLOTHRU40300	ASSY P		1.00 MATPFA
MP	WG00	1E	3.60	3.60	4.60
AS	AC		Y		
AS	DB		Y		
OD		SLOTHRU40400	TEST S		0.35 MATPFA
MP	WG10	1E	2.75	2.75	5.00
EQ	50002	1S	2.75	2.75	5.00
OD		SLOTHRU40500	TEST P		0.35 MATPFA
MP	WG10	1E	26.00	26.00	56.00
EQ	50002	1S	26.00	26.00	56.00
OD		SLOTHRU40600	TEST S		0.65 MATPFA
MP	WG10	1E	2.75	2.75	5.00
EQ	50005	1S	2.75	2.75	5.00
OD		SLOTHRU40700	TEST P		0.65 MATPFA
MP	WG10	1E	26.00	26.00	56.00
EQ	50005	1S	26.00	26.00	56.00
OD		SLOTHRU40800	REP P		0.10 MATPFA
MP	WG00	1E	2.70	2.70	14.90
OD		SLOTHRU40900	TEST S		0.3 MATPFA
MP	WG10	1E	2.75	2.75	5.00
EQ	50002	1S	2.75	2.75	5.00
OD		SLOTHRU41000	TEST P		0.03 MATPFA
MP	WG10	1E	26.00	26.00	56.00
EQ	50002	1S	26.00	26.00	56.00
OD		SLOTHRU41100	TEST S		0.07 MATPFA
MP	WG10	1E	2.75	2.75	5.00
EQ	50005	1S	2.75	2.75	5.00
OD		SLOTHRU41200	TEST P		0.07 MATPFA
MP	WG10	1E	26.00	26.00	56.00
EQ	50005	1S	26.00	26.00	56.00
** ***** SLOTHRU5 *****					
OD		SLOTHRU50100	ASSY P		1.00 MATPFA
MP	WG00	1E	3.10	3.10	6.00
OD		SLOTHRU50200	REP P		1.00 MATPFA
MP	WG00	1E	5.30	5.30	14.90
OD		SLOTHRU50300	TEST S		0.75 MATPFA
MP	WG09	1E	2.00	2.00	2.50
EQ	50173	1S	2.00	2.00	2.50

OD		SLOTHRU50400 TEST P		0.75 MATPFA
MP	WG09	1E	4.00 4.00	5.00
EQ	50173	1S	4.00 4.00	5.00
OD		SLOTHRU50500 ASSY P		0.75 MATPFA
MP	WG00	1E	4.50 4.50	6.80
OD		SLOTHRU50600 TEST S		1.00 MATPFA
MP	WG09	1E	2.00 2.00	2.50
EQ	50173	1S	2.00 2.00	2.50
OD		SLOTHRU50700 TEST P		1.00 MATPFA
MP	WG09	1E	8.00 8.00	12.00
EQ	50173	1S	8.00 8.00	12.00
OD		SLOTHRU50800 REP P		0.10 MATPFA
MP	WG00	1E	5.30 5.30	14.90
OD		SLOTHRU50900 TEST S		0.10 MATPFA
MP	WG09	1E	2.00 2.00	2.50
EQ	50173	1S	2.00 2.00	2.50
OD		SLOTHRU51000 TEST P		0.10 MATPFA
MP	WG09	1E	8.00 8.00	12.00
EQ	50173	1S	8.00 8.00	12.00
OD		SLOTHRU51100 ASSY P		1.00 MATPFA
MP	WG00	1E	3.60 3.60	4.60
**	***** SLOTHRU6 *****			
OD		SLOTHRU60100 REP P		1.00 MATPFA
MP	WG00	1E	3.20 3.20	10.10
OD		SLOTHRU60200 TEST S		1.00 MATPFA
MP	WG09	1E	2.00 2.00	2.50
EQ	50005	1S	2.00 2.00	2.50
OD		SLOTHRU60300 TEST P		1.00 MATPFA
MP	WG09	1E	4.50 4.50	16.00
EQ	50005	1S	4.50 4.50	16.00
OD		SLOTHRU60400 REP P		0.05 MATPFA
MP	WG00	1E	3.20 3.20	10.10
OD		SLOTHRU60500 TEST S		0.05 MATPFA
MP	WG09	1E	2.00 2.00	2.50
EQ	50005	1S	2.00 2.00	2.50
OD		SLOTHRU60600 TEST P		0.05 MATPFA
MP	WG09	1E	4.50 4.50	16.00
EQ	50005	1S	4.50 4.50	16.00
**	***** SLOTHRU7 *****			
OD		SLOTHRU70010 DSSY P		1.00 MATPFA
NR				
DS	GG	Y		
OD		SLOTHRU70020 ASSY P		1.00 MATPFA
NR				
AS	GG	Y		
OD		SLOTHRU70050 DSSY P		1.00 MATPFA
MP	WG00	1E	2.50 2.50	7.00
EQ	50002	1S	2.50 2.50	7.00
DS	AC/DB	Y		
OD		SLOTHRU70100 ASSY P		1.00 MATPFA
MP	WG00	1E	3.60 3.60	6.00
EQ	50002	1S	3.60 3.60	6.00
AS	AC/DB	Y		
OD		SLOTHRU70200 TEST S		1.00 MATPFA
MP	WG11	1E	6.00 6.00	24.00
EQ	50002	1S	6.00 6.00	24.00
OD		SLOTHRU70300 TEST P		1.00 MATPFA
MP	WG11	1E	27.00 27.00	72.00
EQ	50002	1S	27.00 27.00	72.00
OD		SLOTHRU70400 TEST P		1.00 MATPFA
MP	WG11	1E	14.00 14.00	36.00
EQ	50002	1S	14.00 14.00	36.00
OD		SLOTHRU70000 IN P		1.00 MATWIP
MF	WG11	1E	100.0	

NR		SLOTHRUI0100 INSP P	1.00 MATPFA
OD		1C 5.30	
MP	WG00	SLOTHRUI0200 TEST S	0.70 MATPFA
OD		1E 6.00 6.00 12.00	
MP	WG11	1S 6.00 6.00 12.00	
EQ	50002	SLOTHRUI0300 TEST P	0.70 MATPFA
OD		1E 21.00 21.00 34.00	
MP	WG11	1S 21.00 21.00 34.00	
EQ	50002	SLOTHRUI0400 WIP P	1.00 WIP
OD		N 1860.0 840.0	
BS			
NR			
***	***** SUPQTHRU *****		
OD		SUPQTHRU0000 IN P	1.00 MATPFA
MF		C 2.00	
NR			
OD		SUPQTHRU0100 INSP P	1.00 MATPFA
MP	WG11	1C 5.30	
OD		SUPQTHRU0200 TEST S	1.00 MATPFA
MP	WG11	1E 6.00 6.00 12.00	
EQ	50002	1S 6.00 6.00 12.00	
OD		SUPQTHRU0300 TEST P	1.00 MATPFA
MP	WG11	1E 14.00 14.00 36.00	
EQ	50002	1S 14.00 14.00 36.00	
OD		SUPQTHRU0350 TEST P	1.00 MATPFA
MP	WG11	1E 1.50 1.50 5.00	
EQ	50002	1S 1.50 1.50 5.00	
OD		SUPQTHRU0400 PACK P	1.00 MATPFA
MP	WGSW	1E 2.60 2.60 6.60	
OD		SUPQTHRU9999 OUT P	1.00 MATPFA
MF	WG11	1C 4.00	
NR			

ADDITIONAL DOCUMENTATION

UFC MODEL PROCESS FLOW



ENGINEERING NOTES

EMPLOYEE RANDY HARRISDATE 7/2/90 - 7/6/90PAGE NO. 1RCC MATPFASUBJECT DATA Collection

THE DATA COLLECTION EFFORT FOR INITIAL MODEL DEVELOPMENT HAS BEEN NEARLY COMPLETED FOR THE UFC. OPERATION TIMES AND OCCURRENCE FACTORS FOR ALL DECISION NODES HAVE BEEN ESTABLISHED AND ARE BEING REFERENCED BY DIFFERENT SOURCES. THE MAIN EFFORT NOW IS TO DETERMINE THE PROPER INPUT FORMAT FOR THE DATA IN ORDER TO ACCURATELY CAPTURE ALL WORK PROCESSING THROUGH THE SYSTEM WITH REGARD TO THE BRANCHING OCCURRING AT THE DECISION NODES. FURTHER STUDY WILL BE NECESSARY TO ASCERTAIN WHAT APPROACH WILL BE OPTIMAL FOR THE PROCESS FLOW.

DISCRETE DISTRIBUTIONS WILL BE USED TO REPRESENT OPERATIONAL TIMES FOR THE OVERHAUL SECTIONS. THE SPECIFIC TASK CODES WHICH ENCOMPASS AT LEAST 80% OF THE WORK EFFORT HAVE BEEN IDENTIFIED THROUGH OPERATOR INTERVIEWS AND DATA OBTAINED THROUGH THE TRACKER FILES.

SURPRISINGLY, THE "AVERAGE" TIMES CALCULATED THROUGH TRACKER AND ESTIMATES GIVEN BY SHOP PERSONNEL HAVE BEEN FAIRLY CONSISTENT. THE DISCRETE DISTRIBUTION SHOULD ALLOW FOR FLEXIBILITY IN THE PROCESS FLOW.

AS MENTIONED PREVIOUSLY, THE WHF ISSUE SHOULD BE ADDRESSED CONCERNING NOT ONLY BUDGES 347 AND 348 BUT ALSO THE DS WAREHOUSE. IF THE INVENTORY LEVEL IS TO TRULY BE REDUCED, BOTH AREAS MUST BE CONSIDERED AS ONE ENTITY. IT WOULD NOT BE PRACTICAL FROM A COST SAVINGS VIEWPOINT TO INCREASE THE THROUGHPUT OF THE UFC AREA TO SIMPLY HAVE THE UFC'S WAIT IN THE DS WAREHOUSE. THIS "BIG PICTURE" SCENARIO MUST BE ADDRESSED WITH THE CUSTOMER AND CORRECTED WITH A REVISED SCHEDULING SYSTEM. SEVERAL OPTIONS (SUCH AS GRADUALLY DECREASING INDICTIONS) SHOULD BE CONSIDERED AS POSSIBILITIES.

ENGINEERING NOTES

EMPLOYEE RAMON W. HARRIS

DATE 7/16/90 - 7/20/90

PAGE NO. 1

RCC MATPEA

SUBJECT INVENTORY COSTS, MODEL CHANGES

I. MODEL INPUT CHANGES

HAVING EXAMINED THE INITIAL RESULTS OF THE MODEL RUN, SEVERAL CHANGES WERE MADE WITH REGARD TO MANPOWER, EQUIPMENT, AND THE OPERATION PROFILES FOR SPECIFIC WDS. ALTHOUGH THE POSSIBILITY OF SURPLUS MANPOWER WAS QUESTIONED FOR THE OVERHAUL MECHANICS, WE BELIEVE THE FIGURES TO BE CORRECT PRIOR TO THE 7/16/90 SHIFT CHANGES. THE FIGURES WERE OBTAINED FROM THE MANPOWER STATUS BOARD IN TONY PERCE'S AREA AND SPECIFIC WG CLASSIFICATIONS FOR OVERHAUL WERE IDENTIFIED ACCORDINGLY. SINCE PERSONNEL CHANGES IN ADDITION TO SUPERVISORY MOVES OCCURRED DURING THE LAST CHANGE, A CURRENT COUNT WILL BE OBTAINED FROM TONY PERCE TO DETERMINE THE LATEST FIGURES AND COMPARE THEM TO OUR MODEL INPUT DATA.

A SECOND ISSUE CONCERNING MANPOWER IS THAT OF AN ALLOCATION OF MANPOWER FOR THE SAFETY WIRE AREA. EACH SHIFT IS INDICATING THAT ANYWHERE FROM ONE TO THREE PEOPLE WILL BE WORKING IN THE SAFETY WIRE AREA COMPLETING PLATING ID FUNCTIONS, COMPLETING NECESSARY PAPERWORK, AND PERFORMING THE ACTUAL SAFETY WIRE OPERATIONS. SINCE THESE TIMES ARE PROVIDED OUT ACCORDING TO TRACKER TASK CODES, THE PW/SW OPERATIONS WILL BE COMBINED AND THE CURRENT OPERATION TIME PROVIDED IN THE PROFILE. ELECTRICAL TESTING TIME WILL BE DISCOUNTED SINCE IT OCCURS AT THE SQ002 TEST STAND. THEREFORE, A NEW SKILL CODE WILL BE INPUTTED FOR THE SAFETY WIRE PERSONNEL WITH 3 PEOPLE ASSIGNED FIRST SHIFT AND ONE PERSON ASSIGNED FOR SECOND AND FOR THIRD SHIFT.

ALTHOUGH SHIFT CHANGES OCCUR EVERY TWO MONTHS, THE WDS MODEL IS FORMATTED FOR INPUT BY QUARTER. GIVEN THAT PRIMARY CHANGES FOR THE SHIFTS OCCUR WITH THE SUPERVISORS AND NOT NECESSARILY WITH WAGE GRADE PERSONNEL, THERE SHOULD NOT BE SERIOUS DIFFICULTIES INVOLVED WITH THIS SITUATION.

NBW OCCURRENCE FACTORS WILL BE ESTABLISHED FOR 66/AL/DB WORK OVER NOW INFORMATION CURRENTLY BEING COMPILED BY THE OCM TEAM ON QUALIFIED UFGS WITHIN THE LIST THREE WEEKS.

ENGINEERING NOTES

EMPLOYEE RANDY HARRISDATE 7/16/90 - 7/20/90PAGE NO. 2RCC MATPFASUBJECT INVENTORY COST, MODEL CHANGESII. EXAMINATION OF COSTS ASSOCIATED WITH UFC INVENTORY

IN A COMPETITIVE PRIVATE COMPANY THERE ARE BASICALLY FIVE COSTS ASSOCIATED WITH EITHER WORK-IN-PROCESS OR FINISHED GOODS INVENTORY: (1) STORAGE AND HANDLING COSTS; (2) AN INSURANCE COST; (3) THE COST OF CAPITAL TIED UP; (4) PROPERTY TAXES; AND (5) DEPRECIATION AND OBSOLESCENCE. FOR THE PURPOSES OF THE ALL, ONLY (1) AND (3) WOULD BE RELEVANT FOR ANY ANALYSIS OF COST SAVINGS DUE TO INVENTORY REDUCTION. IT WILL BE NECESSARY TO EXAMINE THE ACCOUNTING PROCEDURES OF THE ALL TO DETERMINE HOW THE COSTS ARE FORMULATED, MEASURED, AND TRACKED OVER TIME.

ANOTHER COST TO CONSIDER WOULD BE THE COST OF RUNNING SHORT OR READINESS FOR THE AIR FORCE. IF THIS FACTOR CAN SOMEHOW BE QUANTIFIED THEN AN ANALYSIS MIGHT BE APPROPRIATE.

ENGINEERING NOTES

EMPLOYEE RANDY HARRELSDATE 7/9/90-7/13/90PAGE NO. 1RCC MATPFASUBJECT DATA INPUT FOR UNAS

THERE ARE THREE SIGNIFICANT ISSUES WITH REGARD TO THE MODEL WHICH WILL AFFECT THE OUTPUT TO NO MINOR DEGREE. THE ISSUES CONCERN THE CLASSIFICATION OF OVERHAUL MECHANICS FOR THE GAS GENERATOR, AUGMENTOR COMPARTMENT, AND DISTRIBUTION BODY; THE CLASSIFICATION OF TEST STAND OPERATORS, AND THE DETERMINATION OF OCCURRENCE FACTORS FOR THE SEVERAL WGS CREATED FOR DIFFERENT UFC FLOW POSSIBILITIES.

(1). GENERIC OVERHAUL MECHANICS

THE PRIMARY WAGE GRADES IN THE OVERHAUL AREA ARE THE W609 AND THE W610 LEVELS. FOR ALL PRACTICAL PURPOSES THE W609 AND THE W610 CAN PERFORM THE SAME TASKS IN THEIR RESPECTIVE MECHANICAL UNITS. THEREFORE, COMBINATION OF THE LEVELS INTO ONE DESCRIPTOR IS NOT A MAJOR ISSUE. HOWEVER, TRAINEE LEVELS OF W607 AND W605 ARE PRESENT WITHIN EACH OVERHAUL SECTION AND ARE LIMITED TO PERFORMING CERTAIN FUNCTIONS. A W607 CAN PERFORM APPROXIMATELY 60% OF ALL POSSIBLE WORK TASKS WITHIN THE SECTION WHILE A W605 CAN PERFORM ONLY ABOUT 40% OF THE WORK TASKS. IN THE MODEL, ALL CLASSIFICATIONS OF OVERHAUL WORKERS (W605, W607, W609, AND W610) WERE GROUPED TOGETHER AS ONE (W608). THE INITIAL USAGE REPORT INDICATED A PERCENT UTILIZATION OF 20% AND INDICATES THAT THE COMBINATION DID NOT CREATE A UNIQUE PROBLEM. IF IT BECOMES NECESSARY ON THE BASIS OF SUBSEQUENT RUNS TO BREAK OUT THE TRAINEE LEVELS, THEN A MORE DETAILED STUDY EFFORT WOULD BE NECESSARY TO DETERMINE ACTUAL PERCENTAGE USE OF THE TRAINEES AND INCORPORATE THAT DATA INTO THE MODEL.

(2). TEST STAND OPERATOR ALTERNATES

FOR THE INITIAL MODEL RUN, NO ALTERNATES FOR ANY TEST STAND OPERATOR (W611, W610, W609). SINCE THE MAIN PURPOSE INTENDS W611'S TO BE SPECIFICALLY DESIGNATED TO SUPPORT TEST STANDS.

ENGINEERING NOTES

EMPLOYEE RANDY HARRISDATE 7/9/90 - 7/13/90PAGE NO. 2RCC MATPFASUBJECT Initial Input for UDOS

SINCE W610'S ARE PRIMARILY UTILIZED FOR ASI AND G6 TESTING, THEY WOULD NOT REPRESENTED AS BACK-UP TO THE W611'S, W609'S WERE INDICATED TO SPECIFICALLY WORKING 50173 STANDS AND WORKING THE DISTRIBUTION BODY ON THE 5005 STAND. WITHOUT CONSIDERING BRANCHING POSSIBILITIES, THE MODEL RUN DID NOT ENCOUNTER SERIOUS PROBLEMS. WHEN FAULT PROBABILITIES ARE INPUTTED TO THE MODEL, CONTINGENCY PLANS SHOULD BE DEVELOPED IF UTILIZATION OR QUEUE DIFFICULTIES OCCUR.

(3) OCCURRENCE FACTORS FOR WCO'S.

THE FLOW OF UFL INDUCTIONS CAN BE BROADLY CHARACTERIZED AS "QUICKTHURS" - PARTS WHICH REQUIRE LITTLE OR NO REPAIR AND PASS ALL TESTS THE FIRST TIME - AND "SLOTHURS" - PARTS WHICH FAIL A TEST AT SOME POINT AND THEN REQUIRE FAIRLY EXTENSIVE REPAIR TO SOME SUB-COMPONENT.

THE QUICKTHURS ARE SEPARATED INTO "SUPER QUICK-THURS" - PARTS COMING FROM THE ENGINE LINE WHICH CAN BE DIRECTLY SENT TO THE 5002 TEST STAND FOR THE SAT - AND "QUICKTHURS" WHICH GO THRU RAR, ASI, M&I, AND SAT TESTING AND PASS THE FIRST TIME. THE "SLOTHURS" ARE THE UFLS WHICH WILL GO THROUGH VARIOUS STAGES OF REPAIR SUCH AS THE OCM LINE, THE GAS LEAKAGE REPAIR, THE AC/OB, AND REPAIRS AS NEEDED FOR THE SEPARATE AC AND OB COMPONENTS. ALTHOUGH THIS INITIAL DISCRETE DISTRIBUTION FOR UFL FLOW IS BELIEVED TO BE FAIRLY ACCURATE, THE "LOOPBACK" OR FAULT OCCURRENCES HAVE NOT BEEN ESTABLISHED FOR THE G6, AC/OB, OR AC SECTIONS. THE BRANCHING PROCESS (OR SOME OTHER PROCEDURE) SHOULD INCLUDE PROCESS TIMES TO ACCOUNT FOR THE LOOPBACKS.

THE MODEL DEVELOPMENT PHASE WILL CONTINUE, AND DATA UPDATES WILL BE INPUTTED TO THE RESOURCE FILES APPROPRIATELY.

ENGINEERING NOTES

EMPLOYEE Harris

DATE 9 July 90

PAGE NO. 1

RCC MAIT/FA

SUBJECT Clearance Factors for Model WDS

SUBRE QUICK-THROUGH .03

QUICK-THRU .22

SLOW THROUGH S

② Quick Thru
Fallout.

70%

1
NO DEMATE
WORK

~~20~~ % 5

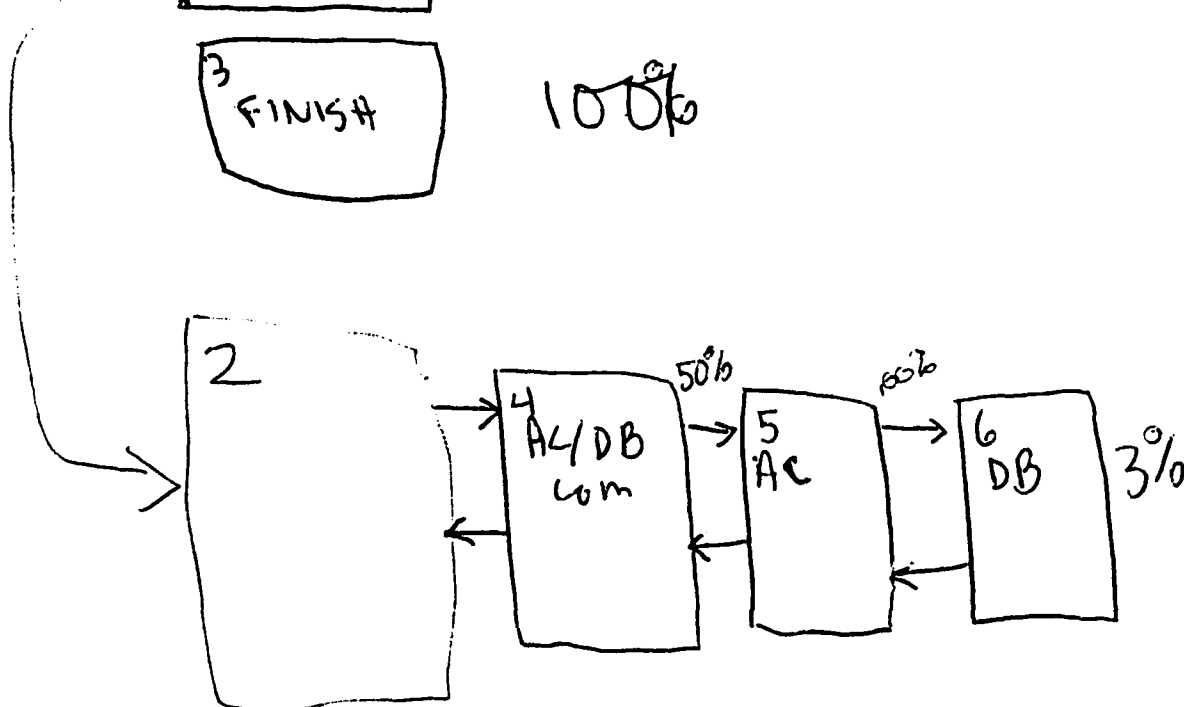
13%

2
DEMATE
WORK

80% .56

3
FINISH

100%



Scott Vroman

MATPFA

46

ENGINEERING NOTES:

7-6-90

Received a general overview of UFC area and answered specific questions.

The approach to process characterization is to start with a high level approach and go into more detail as we go along. High level flat files will be developed and run through the usage report. This will provide feedback as we go along so that we know we are on the right track [see document " Proposed Process Characterization Methodology " for a more detailed description.]

Met with MLH to explain general approach that will be used with the process characterization.

The top most level to the UFC area is to see if the manpower availability and the number of UFCs completed match up. A usage report was run using the inductions, one manpower code with the number of men available including estimates for overtime. A one operation WCD using 1 mp for 367 hours was created. The usage report showed the mp utilization to be 101%.

DPB Section 2.0

080108

47
Scott Vroman
MATPFA

7-9-90

Received more of an overview of the ufc area. There are 3 major areas - incoming inspection, testing, and overhaul. The incoming inspection performs paperwork and assigns an initial routing for the item. As far as modeling is concerned it is a minor area. The overhaul area can be broken down into 4 areas - general overhaul, gas generators [gg], augmented computer [ac], and distribution body [db] areas. The testing area has three sub areas that apparently are not subdivided by function - test stands for various components can be found in all three areas. The areas are D, B and bldg 347.

For the next lower level look at the RCC, it will be broken down into the overhaul area and the test area - those two areas are fairly independent as far as manpower and equipment sharing is concerned. The next lower level will divide into the areas mentioned in the above paragraph although there may some sharing of resources between the areas. Again, the purposes of the subdivisions are:

- to find out how much the resources are used within their respective areas.
 - to logically approach the problem of data collection and subdivide it into manageable parts.
 - to show how the parts flow between the areas.
 - to find how much level of detail is required for data collection.
- The objectives of the customer for experimentation and overall goals of the customer for this task order, along with the time frame we are operating within are needed in order to help determine the level of desired.

Discussed with MLH and SS how resources should be handled in the test area. Even though there are 32 5002 test stands, we will subdivide the test stands into the number for within areas B, D and 347. We discussed modeling each individual machine separately, but that would make the resource file unwieldy, increase model execution time, skew equipment utilizations, and not really add any information to the model. [The preventative maintenance data modeling will be a little more fuzzy but the effect of the fuzziness will be minimal.] The same goes for the manpower in the areas.

It seems the manpower is the important resource to model - there are more than enough test stands for the work - the manpower is the resource in short supply.

DOB Section 8.0

080109

Scott Vroman
MA-PFA

It does not appear that there is any major equipment worth modeling in the overhaul area - this is not definite though. Modeling the manpower should be enough since people have benches to work at - modeling the work space could be necessary if it proves to be a limitation.

There is one main item from the 80/20 list that will be modeled in the ufc area - ufc's. UFCs are subdivided into 2 models - one for F-15s and one for F-16s. Each of these will have 2 subcomponents - gas generators, augmentor computers/distribution bodies. Each of the augmentor computers/distribution bodies will be broken down into 2 subcomponents augmentor computers and distribution bodies. This means we will have exactly 10 different parts in the model workload file for the ufc area. The naming conventions for them will be as follows:

F-15 UFC for the F-15
F-15GG Subcomponent for the F-15 - Gas Generator
F-15AC/DB Subcomponent for the F-15 - Augmentor
Computer/Distribution body combination.
F-15AC Subcomponent for the F-15AC/DB - Augmentor Computer
F-15DB Subcomponent for the F-15AC/DB - Distribution Body

F-16 UFC for the F-16
F-16GG Subcomponent for the F-16 - Gas Generator
F-16AC/DB Subcomponent for the F-16 - Augmentor
Computer/Distribution body combination.
F-16AC Subcomponent for the F-16AC/DB - Augmentor Computer
F-16DB Subcomponent for the F-16AC/DB - Distribution Body

The inductions that will be used for the model are:

	Q1	Q2	Q3	Q4
F-15	104	104	176	140
F-16	188	77	182	142

It is felt that the induction numbers are accurate. MLH and SS support this. The numbers are from 4 quarter 89 to 3rd quarter 1990.

DDB Section 8.0

080110

Scott Vroman

MATPFA

49

MLH gave us the DPSH for the UFC at 367 hours. She feels that 250 hours are what they could be done in. With a manpower factor to be used in the model of approximately 25%, 250 hours may be the total number that is desired. Standard flow days are about 59, with the actual being over 100

DDB section 2.0

080111

Scott Vroman
MATPFA

50

7/09/90 - Monday

I have obtained a copy of the Actual Indirect Labor Factor report, A-GO37G-EH1-M1-8EH, which lists both the indirect + leave hours, and the the direct labor hours for the present fiscal year. (Note: The fourth quarter of this report is budgeted hours, not actual). This report should be useful for determining the manpower availability factor for use in the model resource files. The following calculations are applicable:

October '89 -

Total Direct hours charged = 24,522

*Estimated hours available = 28,320

*(based on 177 wage grade personnel assigned, with maximum possible availability 160 hrs. per month per person, assuming straight eight hour day).

Oct. manpower availability factor: $24,522/28,320 \times 8 \text{ hrs.} = 6.93$

Similarly, for the following months, the availability factor is calculated as :

Nov. -6.35 1st. qtr. FY '90 total = 6.06

Dec. -4.89

Jan. -7.29

Feb. -6.71 2nd. qtr. FY '90 total = 7.15

Mar. -7.44

Apr. -6.91

May -6.69 3rd. qtr. FY '90 total = 6.72

June -6.56

The 4th qtr. FY '90 estimated availability is 6.22 hours.

DDB Section 8.0

080112

ENGINEERING NOTES

EMPLOYEE Scott Vroman DATE 19 July 90 PAGE NO. 1
RCC MATPEA SUBJECT Flat File Construction

ENGINEERING NOTES

7-10-90 to 7-16-90

Primarily I was involved with preparing a 2nd cut model for the UFC area and running the model. A high level version with branching represented but no rework [or cycling] was created and run on the VAX. Notes on the 2nd cut effort are included for reference.

DDB SECTION CODE 810DDB PAGE NO. 080113

ENGINEERING NOTES

EMPLOYEE Scott Vroman DATE 14 July 90 PAGE NO. 2
RCC INATPEA SUBJECT F16 F16 Const.

UFC 2nd CUT MODEL

A 2nd cut version of the model was prepared. It will provide the basic structure of the WCDs and flow of the parts with estimates for manpower usage and equipment usage. The branching that occurs within the RCC will not be modeled directly but will be approximated through repeating operations and WCDs.

INPUT NOTES:**WORKLOAD NOTES:**

The workload is broken down into subcategories by the amount and type of work that needs to be done. The workload is broken down into three types:

"Super Quick Throughs" - Basically they come in and are run through the SAT test, everything checks out fine and they are done after safety wiring. This accounts for approximately 3% of the workload.

"Quick Throughs" - These also require no or very little overhaul work. They run through tests such as an abbreviated augmentor set-in test, an M & I and an SAT. They check out fine and are done. This accounts for approximately 22% of the workload.

"Slow Throughs" - These are items that fall-out of a test and may require overhaul and demating, extensive testing, etcetera. This accounts for 75% of the workload. These items are the ones that produce the subassemblies of the gas generator, the augmentor computer and the distribution body.

The workloads for the F-15s and the F-16s will be adjusted to reflect these categories.

Subcomponents modeled are the gas generator, the AC/DB, the AC and the DB. The gas generator is not called out specifically, but is kept a part of the F-15ST and the F-16ST. The AC/DB produces the parts AC and DB.

These parts are different than what was used in the first cut of the model and reflect the needs of the second cut.

RESOURCE NOTES:

The UFC area has 2 main areas -overhaul and test. The manpower is basically divided between the 2 areas with little cross-over between the two. In the model, there will be no sharing between the 2 areas.

ENGINEERING NOTES

EMPLOYEE Scott Norman DATE 19 July 90 PAGE NO. 3
 RCC NAH/FH SUBJECT Flat File Const.

In the test area, the manpower grades are fairly divided by what test stands they can operate. There are a couple of exceptions, but the supervisors on the floor try to avoid the exceptions. Manpower grades will be associated with certain test stands in the model files.

In the overhaul area, all manpower grades will be approximated by a psuedo-grade called WG00. WG00 will do any overhaul work done. In reality WG05s and WG07s can not do some operations. However, since the overhaul work will be approximated by one operation, this is not a bad assumption for this cut.

Most of the overtime was performed on the weekends by the testing personnel. All of the overtime in the model files is being performed on the weekends. Given the overtime for the quarter, an equivalent number of weekend people was computed and put into the model resource file. The number of people available was reduced by an appropriate amount to account for disability, leave, etc.

The test stands are not broken down by separate areas [areas B,D and bldg 347]. When a test need to be performed on a part it is sent to any area that has an available operator [Manpower is in short supply, not the equipment]. This assumption is a good one because the work can go to any area.

OPERATION NOTES:

WCDs were created for the Super-Quick Throughs, Quick Throughs, and SlowThroughs.

The Super-Quick-Throughs [part names F-15SQT and F-16SQT] performed wcd SUPQTHRU.

The Quick-Throughs [part names F-15QT and F-16QT] performed wcd QUIKTHRU.

The F-15 Slow-Throughs [part name F-15ST] performed wcds SLOTHRU1, SLOTHRU0, SLOTHRU1, SLOTHRU2, and SLOTHRU3. The F-16 Slow-Throughs [part name F-16ST] performed wcds SLOTHRU1, SLOTHRU0, SLOTHRU1, and SLOTHRU3.

The AC/DB performs wcd SLOTHRU4 and is created in wcd SLOTHRU2.

The AC performs wcd SLOTHRU5 and is created in wcd SLOTHRU4 .

The DB performs wcd SLOTHRU6 and is created in wcd SLOTHRU5.

The F-15ST and the F-16ST disassembles and assembles the AC/DB in wcd SLOTHRU3. The AC/DB disassembles and assembles the AC which disassembles and assembles the DB.

ENGINEERING NOTES

EMPLOYEE Scott Vroman DATE 19 July 90 PAGE NO. 4
RCC MATPFA SUBJECT Flat File Cond.

It was indicated that the AC/DBs are not generally worked until the Gas generators are finished being worked so the disassembly for the AC/DB did not occur until after the gas generator work was completed [wcd SLOTHRU2, operation 0600]. To make the AC/DB work in parallel with the gas generator, move the operation to before operation 0100.

The input flat files are included as reference.

OUTPUT NOTES:

A copy of the output is included for reference. The flow times for the "Slow Throughs" are too short but may not be as short as first thought - the data on historical flow times will be re-examined. ~~Reasons for the short flow times include waiting for parts not been modeled~~ but is included in the historical flow times; and all of the recycling, or rework, has not been added to the model yet. This is also reflected in the expected hours calculated by the model.

The flow times for the "Quick Throughs" and the "Superquick Throughs" may be in line with reality. A meeting with ALC personnel is needed to show them the current state of the model and to obtain feedback in areas where the flat files need to be corrected.

↑
27 July 90
14:00 ✓

FLAT FILES FOR
SECOND CUT.

080117

AC	SLOTHRU5	4				0.50			1A
							S		B
AC/DB	SLOTHRU4	4				0.50			1A
							S		B
DB	SLOTHRU6	4				0.03			1A
							S		B
F-15QT	QUIKTHRU	4	23	23	39	31	0.22 1.00		1A
									B
F-15SQT	SUPQTHRU	4	3	3	5	4	0.03 1.00	367	1A
									B
F-15ST	SLOTHRU1	4	80	78	132	105	1.00		1A
									B
F-15ST	SLOTHRU0						0.70		
F-15ST	SLOTHRU1						0.20		
F-15ST	SLOTHRU2						0.80		
F-15ST	SLOTHRU3						1.00		
F-16QT	QUIKTHRU	4	41	17	40	31	0.22 1.00		1A
									B
F-16SQT	SUPQTHRU	4	6	2	5	4	0.03 1.00	367	1A
									B
F-16ST	SLOTHRU1	4	141	58	136	107	1.00		1A
F-16ST	SLOTHRU0						0.70		
									B
F-16ST	SLOTHRU2						0.20 1.00		
F-16ST	SLOTHRU3						1.00		

PART FILE

corrections made to flat
files after printouts produced.

EQ 50002	1	33	33	33	33	33	33	33	33	33	33	33	.00	.00	.00	.00	.00	.00	.00	.00
EQ 50002	2	33	33	33	33	33	33	33	33	33	33	33	.00	.00	.00	.00	.00	.00	.00	.00
EQ 50002	3	33	33	33	33	33	33	33	33	33	33	33	.00	.00	.00	.00	.00	.00	.00	.00
EQ 50002	4	32	32	32	32	32	32	32	32	32	32	32	.00	.00	.00	.00	.00	.00	.00	.00
RN		50002																		
BZ	1	1																		
BF		T 0.00 0.75 21.00																		
TR		E 0.90																		
EQ 50004	1	10	10	10	10	10	10	10	10	10	10	10	.00	.00	.00	.00	.00	.00	.00	.00
EQ 50004	2	10	10	10	10	10	10	10	10	10	10	10	.00	.00	.00	.00	.00	.00	.00	.00
EQ 50004	3	10	10	10	10	10	10	10	10	10	10	10	.00	.00	.00	.00	.00	.00	.00	.00
EQ 50004	4	9	9	9	9	9	9	9	9	9	9	9	.00	.00	.00	.00	.00	.00	.00	.00
RN		50004																		
BZ	1	1																		
BF		T 0.00 1.50 22.00																		
TR		E 1.00																		
EQ 50005	1	6	6	6	6	6	6	6	6	6	6	6	.00	.00	.00	.00	.00	.00	.00	.00
EQ 50005	2	6	6	6	6	6	6	6	6	6	6	6	.00	.00	.00	.00	.00	.00	.00	.00
EQ 50005	3	6	6	6	6	6	6	6	6	6	6	6	.00	.00	.00	.00	.00	.00	.00	.00
EQ 50005	4	5	5	5	5	5	5	5	5	5	5	5	.00	.00	.00	.00	.00	.00	.00	.00
RN		50005																		
BZ	1	1																		
BF		T 0.00 2.00 17.00																		
TR		E 1.00																		
EQ 50173	1	17	17	17	17	17	17	17	17	17	17	17	.00	.00	.00	.00	.00	.00	.00	.00
EQ 50173	2	17	17	17	17	17	17	17	17	17	17	17	.00	.00	.00	.00	.00	.00	.00	.00
EQ 50173	3	17	17	17	17	17	17	17	17	17	17	17	.00	.00	.00	.00	.00	.00	.00	.00
EQ 50173	4	16	16	16	16	16	16	16	16	16	16	16	.00	.00	.00	.00	.00	.00	.00	.00
RN		50173																		
BZ	1	1																		
BF		T 0.00 19.00 97.00																		
TR		E 0.58																		
MP WG00	1	39	11	10	1	1	0	0	0	0	0	0	04.604	04.604	04.604	04.604	04.600	000	000	000
MP WG00	2	39	11	10	1	1	0	0	0	0	0	0	04.604	04.604	04.604	04.604	04.600	000	000	000
MP WG00	3	39	11	10	1	1	0	0	0	0	0	0	04.604	04.604	04.604	04.604	04.600	000	000	000
MP WG00	4	39	11	10	1	1	0	0	0	0	0	0	04.604	04.604	04.604	04.604	04.600	000	000	000
RN		WG00																		
MP WG09	1	4	2	1	0	0	0	0	0	0	0	0	05.475	0475.475	0470.000	000	000	000	000	000
MP WG09	2	4	2	1	0	0	0	0	0	0	0	0	05.405	0405.405	0400.000	000	000	000	000	000
MP WG09	3	4	2	1	0	0	0	0	0	0	0	0	04.604	0404.600	000	000	000	000	000	000
MP WG09	4	4	4	1	0	0	0	0	0	0	0	0	05.165	0165.165	0160.000	000	000	000	000	000
RN		WG09																		
MP WG10	1	9	5	2	6	4	2	0	0	0	0	0	06.806	0606.806	0606.806	0606.806	0600.000	000	000	000
MP WG10	2	9	5	2	6	4	2	0	0	0	0	0	06.806	0606.806	0606.806	0606.806	0600.000	000	000	000
MP WG10	3	8	4	2	6	4	2	0	0	0	0	0	06.806	0606.806	0606.806	0606.806	0600.000	000	000	000
MP WG10	4	9	4	2	6	4	2	0	0	0	0	0	06.806	0606.806	0606.806	0606.806	0600.000	000	000	000
RN		WG10																		
MP WG11	1	22	15	15	12	8	8	0	0	0	0	0	06.806	0606.806	0606.806	0606.806	0600.000	000	000	000
MP WG11	2	22	15	15	12	8	8	0	0	0	0	0	06.806	0606.806	0606.806	0606.806	0600.000	000	000	000
MP WG11	3	19	13	13	12	8	8	0	0	0	0	0	06.806	0606.806	0606.806	0606.806	0600.000	000	000	000
MP WG11	4	21	14	14	12	8	8	0	0	0	0	0	06.806	0606.806	0606.806	0606.806	0600.000	000	000	000
RN		WG11																		
MP WGAA	1	4	2	1	0	0	0	0	0	0	0	0	05.475	0475.475	0470.000	000	000	000	000	000
MP WGAA	2	4	2	1	0	0	0	0	0	0	0	0	05.405	0405.405	0400.000	000	000	000	000	000
MP WGAA	3	4	2	1	0	0	0	0	0	0	0	0	04.604	0404.600	000	000	000	000	000	000
MP WGAA	4	4	4	1	0	0	0	0	0	0	0	0	05.165	0165.165	0160.000	000	000	000	000	000
RN		WGAA																		
AR		WG09																		

RESOURCE FILE

080119

OPERATION
FILE

OD		QUIKTHRU0000 IN P	1.00	MATPFA
MF	WG11	1C 2.00		
NR				
OD		QUIKTHRU0100 INSP P	1.00	MATPFA
MP	WG00	1C 5.30		
OD		QUIKTHRU0200 TEST S	1.00	MATPFA
MP	WG11	1T 2.00 6.00	12.00	
EQ	50002	1T 2.00 6.00	12.00	
OD		QUIKTHRU0300 TEST P	1.00	MATPFA
MP	WG11	1T 2.00 21.00	34.00	
EQ	50002	1T 2.00 21.00	34.00	
OD		QUIKTHRU0400 TEST P	0.28	MATPFA
MP	WG11	1T 6.00 22.00	36.00	
EQ	50002	1T 6.00 22.00	36.00	
OD		QUIKTHRU0500 TEST P	1.00	MATPFA
MP	WG11	1T 6.00 27.00	72.00	
EQ	50002	1T 6.00 27.00	72.00	
OD		QUIKTHRU0600 TEST P	1.00	MATPFA
MP	WG11	1T 2.00 14.00	36.00	
EQ	50002	1T 2.00 14.00	36.00	
OD		QUIKTHRU0700 PACK P	1.00	MATPFA
MP	WG00	1T 0.90 4.10	11.40	
OD		QUIKTHRU9999 OUT P	1.00	MATPFA
MF	NR	1C 4.00		
OD		SLOTHRU00100 TEST S	1.00	MATPFA
MP	WG11	1T 2.00 6.00	12.00	
EQ	50002	1T 2.00 6.00	12.00	
OD		SLOTHRU00200 TEST P	1.00	MATPFA
MP	WG11	1T 2.00 21.00	34.00	
EQ	50002	1T 2.00 21.00	34.00	
OD		SLOTHRU00300 TEST P	0.19	MATPFA
MP	WG11	1T 6.00 22.00	36.00	
EQ	50002	1T 6.00 22.00	36.00	
OD		SLOTHRU00400 TEST P	0.46	MATPFA
MP	WG11	1T 6.00 27.00	72.00	
EQ	50002	1T 6.00 27.00	72.00	
OD		SLOTHRU00500 TEST P	0.30	MATPFA
MP	WG11	1T 2.00 14.00	36.00	
EQ	50002	1T 2.00 14.00	36.00	
OD		SLOTHRU10100 REP P	1.00	MATPFA
MP	WG00	1T 1.50 2.00	1.00 2.9	
OD		SLOTHRU10200 TEST S	1.00	MATPFA
MP	WG11	1T 2.00 6.00	12.00	
EQ	50002	1T 2.00 6.00	12.00	
OD		SLOTHRU10300 TEST P	0.75	MATPFA
EQ	WG11	1T 6.00 27.00	72.00	
EQ	50002	1T 6.00 27.00	72.00	
OD		SLOTHRU20100 REP P	0.50	MATPFA
MP	WG00	1T 0.50 3.40	5.20	
OD		SLOTHRU20200 TEST S	0.50	MATPFA
MP	WG10	1T 2.00 3.00	16.00	
EQ	50004	1T 2.00 3.00	16.00	
OD		SLOTHRU20300 TEST P	0.50	MATPFA
MP	WG10	1T 6.00 24.00	70.00	
EQ	50004	1T 6.00 24.00	70.00	
OD		SLOTHRU20600 ASSY P	1.00	MATPFA
MP	WG00	1T 2.00 2.50	7.00	
DS		Y		
OD		SLOTHRU20700 ASSY P	1.00	MATPFA
MP	WG00	1T 1.00 3.60	6.00	
AS		Y		
OD		SLOTHRU20800 TEST S	1.00	MATPFA
MP	WG11	1T 2.00 6.00	24.00	
EQ	50002	1T 2.00 6.00	24.00	

083120

OD		SLOTHRU20900 TEST P	1.00 MATPFA
MP	WG11	1T 6.00 27.00	72.00
EQ	50002	1T 6.00 27.00	72.00
OD		SLOTHRU21000 TEST P	0.75 MATPFA
MP	WG11	1T 2.00 14.00	36.00
EQ	50002	1T 2.00 14.00	36.00
OD		SLOTHRU30100 PACK P	1.00 MATPFA
MP	WG00	1T 0.90 4.10	11.40
OD		SLOTHRU39999 OUT P	1.00 MATPFA
MF		1C 4.00	
NR			
OD		SLOTHRU40100 REP P	1.00 MATPFA
MP	WG00	1T 1.20 2.70	14.90
OD		SLOTHRU40200 ASSY P	1.00 MATPFA
MP	WG00	1T 2.00 3.10	6.00
DS	AC	Y	
OD		SLOTHRU40300 ASSY P	1.00 MATPFA
MP	WG00	1T 2.50 3.60	4.60
AS	AC	Y	
OD		SLOTHRU40400 TEST S	1.00 MATPFA
MP	WG10	1T 1.75 2.75	5.00
EQ	50002	1T 1.75 2.75	5.00
OD		SLOTHRU40500 TEST P	1.00 MATPFA
MP	WG10	1T 2.00 26.00	56.00
EQ	50002	1T 2.00 26.00	56.00
OD		SLOTHRU50100 ASSY P	1.00 MATPFA
MP	WG00	1T 2.00 3.10	6.00
DS	DB	Y	
OD		SLOTHRU50200 REP P	1.00 MATPFA
MP	WG00	1T 1.10 5.30	14.90
OD		SLOTHRU50300 TEST S	0.75 MATPFA
MP	WG09	1T 0.75 2.00	2.50
EQ	50173	1T 0.75 2.00	2.50
OD		SLOTHRU50400 TEST P	0.75 MATPFA
MP	WG09	1T 2.00 4.00	5.00
EQ	50173	1T 2.00 4.00	5.00
OD		SLOTHRU50500 ASSY P	0.75 MATPFA
MP	WG00	1T 1.80 4.50	6.80
OD		SLOTHRU50600 TEST S	1.00 MATPFA
MP	WG09	1T 0.75 2.00	2.50
EQ	50173	1T 0.75 2.00	2.50
OD		SLOTHRU50700 TEST P	1.00 MATPFA
MP	WG09	1T 4.00 8.00	12.00
EQ	50173	1T 4.00 8.00	12.00
OD		SLOTHRU50800 ASSY P	1.00 MATPFA
MP	WG00	1T 2.50 3.60	4.60
AS	DB	Y	
OD		SLOTHRU60100 REP P	1.00 MATPFA
MP	WG00	1T 1.30 3.20	10.10
OD		SLOTHRU60200 TEST S	1.00 MATPFA
MP	WG09	1T 0.75 2.00	2.50
EQ	50005	1T 0.75 2.00	2.50
OD		SLOTHRU60300 TEST P	1.00 MATPFA
MP	WG09	1T 2.00 4.50	16.00
EQ	50005	1T 2.00 4.50	16.00
OD		SLOTHRU10000 IN P	1.00 MATPFA
MF	WG11	1C 2.00	
NR			
OD		SLOTHRU10100 INSP P	1.00 MATPFA
MP	WG00	1C 5.30	
OD		SUPQTHRU00000 IN P	1.00 MATPFA
MF		C 2.00	
NR			
OD		SUPQTHRU0100 INSP P	1.00 MATPFA

080121

60

MP	WG11	1C	5.30		
OD		SUPQTHRU0200 TEST S		1.00	MATPFA
MP	WG11	1T	2.00	6.00	12.00
EQ	50002	1T	2.00	6.00	12.00
OD		SUPQTHRU0300 TEST P		1.00	MATPFA
MP	WG11	1T	2.00	14.00	36.00
EQ	50002	1T	2.00	14.00	36.00
OD		SUPQTHRU0400 PACK P		1.00	MATPFA
MP	W600	1T	0.90	4.10	11.40
OD	W600	SUPQTHRU9999 OUT P		1.00	MATPFA
MF	WG11	1C	4.00		
NR					

083122

USAGE REPORT

2nd CUT

NOTE: THAT THE USAGE REPORT DOES NOT
TAKE THE OCCURRENCE FACTOR ON WCDs
INTO ACCOUNT. UTILIZATIONS FOR THE WELL,
FOR EXAMPLE, ARE LOWER THAN SHOWN

080123

THIS USAGE REPORT IS FOR RCC: A
 THIS REPORT PROVIDES THE ESTIMATED USAGE FOR
 EACH RESOURCE BY PART.

RESOURCE NAME: 50002 RESOURCE NOUN: 50002
 NO ALTERNATES FOUND FOR THIS RESOURCE

PART NAME	YEARLY INDUCTIONS	TOTAL HOURS NEEDED
F-15QT	116.	9171.73
F-15SQT	15.	330.00
F-15ST	393.	51120.12
F-16QT	129.	10199.60
F-16SQT	17.	374.00
F-16ST	442.	34915.05

TOTAL HOURS NEEDED TO PROCESS ALL PARTS: 106110.51

TOTAL HOURS AVAILABLE: 286104.00

PROJECTED UTILIZATION FOR THIS RESOURCE: .37

RESOURCE NAME: 50004 RESOURCE NOUN: 50004
 NO ALTERNATES FOUND FOR THIS RESOURCE

PART NAME	YEARLY INDUCTIONS	TOTAL HOURS NEEDED
F-15ST	393.	6615.50

TOTAL HOURS NEEDED TO PROCESS ALL PARTS: 6615.50

TOTAL HOURS AVAILABLE: 85176.00

PROJECTED UTILIZATION FOR THIS RESOURCE: .08

RESOURCE NAME: 50005 RESOURCE NOUN: 50005
 NO ALTERNATES FOUND FOR THIS RESOURCE

PART NAME	YEARLY INDUCTIONS	TOTAL HOURS NEEDED
DB	393.	3094.88

TOTAL HOURS NEEDED TO PROCESS ALL PARTS: 3094.88

TOTAL HOURS AVAILABLE: 50232.00

PROJECTED UTILIZATION FOR THIS RESOURCE: .06

RESOURCE NAME: 50173 RESOURCE NOUN: 50173
 NO ALTERNATES FOUND FOR THIS RESOURCE

080124

PART NAME	YEARLY INDUCTIONS	TOTAL HOURS NEEDED
AC	393.	5563.41
TOTAL HOURS NEEDED TO PROCESS ALL PARTS:		5563.41
TOTAL HOURS AVAILABLE:		146328.00
PROJECTED UTILIZATION FOR THIS RESOURCE:		.04

RESOURCE NAME:WG00 RESOURCE NOUN: WG00
NO ALTERNATES FOUND FOR THIS RESOURCE

PART NAME	YEARLY INDUCTIONS	TOTAL HOURS NEEDED
AC	393.	2744.45
DB	393.	1585.10
F-15QT	116.	1169.67
F-15ST	393.	632.07
F-16QT	129.	1300.75
TOTAL HOURS NEEDED TO PROCESS ALL PARTS:		7432.04
TOTAL HOURS AVAILABLE:		72716.81
PROJECTED UTILIZATION FOR THIS RESOURCE:		.10

RESOURCE NAME:WG09 RESOURCE NOUN: WG09
NO ALTERNATES FOUND FOR THIS RESOURCE

PART NAME	YEARLY INDUCTIONS	TOTAL HOURS NEEDED
AC	393.	5563.41
DB	393.	3094.88
TOTAL HOURS NEEDED TO PROCESS ALL PARTS:		8658.28
TOTAL HOURS AVAILABLE:		10057.45
PROJECTED UTILIZATION FOR THIS RESOURCE:		.86

* 75% PROJECTED UTILIZATION REACHED *
** PLEASE INVESTIGATE **

RESOURCE NAME:WG10 RESOURCE NOUN: WG10
NO ALTERNATES FOUND FOR THIS RESOURCE

PART NAME	YEARLY INDUCTIONS	TOTAL HOURS NEEDED
--------------	----------------------	-----------------------

080125

AC/DB 393. 11773.62
F-15ST 393. 6615.50
TOTAL HOURS NEEDED TO PROCESS ALL PARTS: 18389.12
TOTAL HOURS AVAILABLE: 35448.41
PROJECTED UTILIZATION FOR THIS RESOURCE: .52

RESOURCE NAME:WG11 RESOURCE NOUN: WG11
NO ALTERNATES FOUND FOR THIS RESOURCE

PART NAME	YEARLY INDUCTIONS	TOTAL HOURS NEEDED
F-15QT	116.	9171.73
F-15SQT	15.	409.50
F-15ST	393.	51120.12
F-16QT	129.	10199.60
F-16SQT	17.	464.10
F-16ST	442.	34915.05
TOTAL HOURS NEEDED TO PROCESS ALL PARTS:		106280.10
TOTAL HOURS AVAILABLE:		107317.60
PROJECTED UTILIZATION FOR THIS RESOURCE:		.99

* 75% PROJECTED UTILIZATION REACHED *
** PLEASE INVESTIGATE **

RESOURCE NAME:WGAA RESOURCE NOUN: WGAA
ALTERNATES FOR THIS RESOURCE

WG09

PART NAME	YEARLY INDUCTIONS	TOTAL HOURS NEEDED
TOTAL HOURS NEEDED TO PROCESS ALL PARTS:		.00
TOTAL HOURS AVAILABLE:		10057.45
PROJECTED UTILIZATION FOR THIS RESOURCE:		.00

THIS USAGE REPORT IS FOR RCC: ✕
THIS REPORT PROVIDES THE REQUIREMENTS FOR
EACH PART BY RESOURCE.

PART NAME:AC

AIRFRAME:

YEARLY INDUCTIONS: 2.147418E+09
RESOURCE

TOTAL

080126

PART NAME:F-15ST

AIRFRAME:

YEARLY INDUCTIONS: 393.000

RESOURCE NAME	TOTAL HOURS NEEDED
50002	51120.12
50004	6615.50
WG00	632.07
WG10	6615.50
WG11	51120.12

TOTAL HOURS NEEDED TO PROCESS THIS PART: 116103.32

PART NAME:F-16QT

AIRFRAME:

YEARLY INDUCTIONS: 129.000

RESOURCE NAME	TOTAL HOURS NEEDED
50002	10199.60
WG00	1300.75
WG11	10199.60

TOTAL HOURS NEEDED TO PROCESS THIS PART: 21699.95

PART NAME:F-16SQT

AIRFRAME:

YEARLY INDUCTIONS: 17.0000

RESOURCE NAME	TOTAL HOURS NEEDED
50002	374.00
WG11	464.10

TOTAL HOURS NEEDED TO PROCESS THIS PART: 838.10

PART NAME:F-16ST

AIRFRAME:

YEARLY INDUCTIONS: 442.000

RESOURCE NAME	TOTAL HOURS NEEDED
50002	34915.05
WG11	34915.05

TOTAL HOURS NEEDED TO PROCESS THIS PART: 69830.10

66

NAME	HOURS NEEDED
50173	*****
WG00	*****
WG09	*****

TOTAL HOURS NEEDED TO PROCESS THIS PART:*****

PART NAME:AC/DB

AIRFRAME:

YEARLY INDUCTIONS: 328187.

RESOURCE NAME	TOTAL HOURS NEEDED
50002	9831935.00
WG10	9831935.00

TOTAL HOURS NEEDED TO PROCESS THIS PART:19663870.00

PART NAME:DB

AIRFRAME:

YEARLY INDUCTIONS: 2.147418E+09

RESOURCE NAME	TOTAL HOURS NEEDED
50005	*****
WG00	*****
WG09	*****

TOTAL HOURS NEEDED TO PROCESS THIS PART:*****

PART NAME:F-15QT

AIRFRAME:

YEARLY INDUCTIONS: 116.000

RESOURCE NAME	TOTAL HOURS NEEDED
50002	9171.73
WG00	1169.67
WG11	9171.73

TOTAL HOURS NEEDED TO PROCESS THIS PART: 19513.13

PART NAME:F-15SQT

AIRFRAME:

YEARLY INDUCTIONS: 15.0000

RESOURCE NAME	TOTAL HOURS NEEDED
50002	330.00
WG11	409.50

TOTAL HOURS NEEDED TO PROCESS THIS PART: 739.50

080128

ENGINEERING NOTES

EMPLOYEE _____ DATE _____ PAGE NO. _____

RCC _____ SUBJECT _____

OUT DUT
FROM 2nd CUT

DDB SECTION CODE _____

DDB PAGE NO. _____ 080129

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 18-JUL-90 TIME: 07:00:12 REPT.ID: UFC 2ND PAGE: 1

RUN PARAMETERS

UDOS :
THIS JOB WAS RAN ON AFTIES, A VAX OF ENPOWERMENT.

ALC: SA

RCC: MATPFA

REPORT ID: UFC 2ND

THIS RUN IS FOR THE HIGH LEVEL 2ND CUT OF THE UFC AREA

PART FILE: UFC2PART.DAT
RES FILE: UFC2RES.DAT
OPER FILE: UFC2OPS.DAT
ETC FILE: UFC2ETC.DAT

WEEKENDS = Y

NUMBER OF QUARTERS = 4

WARM UP PERIOD; STATS WILL BE CLEARED AT DAY 91

OF HOLIDAYS 0

HISTORICAL DATA SHIFT FACTOR 8.000000

BACKSHOP DATA SHIFT FACTOR 24.00000

NEW DATA FORMATS SELECTED

SIMULATION CPU TIME: 18.81 MINUTES

SIMULATION LAPSE TIME: 19.20 MINUTES

SIMULATION RUN LENGTH: 10920.00 HOURS

Number of Items : 9
 Number of Resources : 9
 Number of WCDs : 16
 Number of Operations : 51
 Operations completed : 18934
 ALC: SA RCC: MATPFA QUARTER: 4 DATE: 18-JUL-90 TIME: 07:00:12 REPT.ID: UFC 2ND PAGE: 2

ITEM INDUCTIONS

	1ST QTR	2ND QTR	3RD QTR	4TH QTR	YTD
INDUCTIONS OF ITEM AC	108	61	103	99	371
INDUCTIONS OF ITEM AC/DB	205	122	195	199	721
INDUCTIONS OF ITEM DB	62	33	56	54	205
INDUCTIONS OF ITEM F-15QT	23	23	39	31	116
INDUCTIONS OF ITEM F-15SQT	3	3	5	4	15
INDUCTIONS OF ITEM F-15ST	78	78	132	105	393
INDUCTIONS OF ITEM F-16QT	41	17	40	31	129
INDUCTIONS OF ITEM F-16SQT	6	2	5	4	17
INDUCTIONS OF ITEM F-16ST	141	58	136	107	442

TOTAL ITEM INDUCTIONS

: 667 397 711 634 2409

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 18-JUL-90 TIME: 07:00:12 REPT.ID: UFC 2ND PAGE: 3

WCD INDUCTIONS

	1ST QTR	2ND QTR	3RD QTR	4TH QTR	YTD
INDUCTIONS OF WCD	62	33	56	54	205
INDUCTIONS OF WCD	108	61	103	99	371
INDUCTIONS OF WCD	1	2	0	1	4
INDUCTIONS OF WCD	23	23	39	31	116
INDUCTIONS OF WCD	3	3	5	4	15
INDUCTIONS OF WCD	78	78	132	105	393
INDUCTIONS OF WCD	56	64	90	75	285
INDUCTIONS OF WCD	18	12	19	27	76
INDUCTIONS OF WCD	62	60	86	86	294
INDUCTIONS OF WCD	78	80	101	107	366
INDUCTIONS OF WCD	41	17	40	31	129

INDUCTIONS OF WCD	SUPQTHRU:	6	2	5	4	17
INDUCTIONS OF WCD	SLOTHRU1:	141	58	136	107	442
INDUCTIONS OF WCD	SLOTHRU0:	101	38	94	83	316
INDUCTIONS OF WCD	SLOTHRU2:	139	63	111	120	433
INDUCTIONS OF WCD	SLOTHRU3:	133	74	83	125	415

TOTAL WCD INDUCTIONS : 1050 668 1100 1059 3877

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 18-JUL-90 TIME: 07:00:12 REPT.ID: UFC 2ND PAGE: 4

FLOW CYCLE TIME STATISTICS

ITEM	HISTORICAL FLOWTIME HOURS	AVERAGE SIMULATED FLOW TIME HOURS	STANDARD DEVIATION	SIMULATED MINIMUM FLOW TIME HOURS	SIMULATED MAXIMUM FLOW TIME HOURS	NUMBER OF SAMPLES	NUMBER OF INDUCTIONS
AC	0.00	73.40	23.38	34.30	121.47	203	371
AC/DB	0.00	141.50	53.25	45.97	311.58	369	721
DB	0.00	38.44	22.17	23.42	71.42	4	205
F-15QT	0.00	323.53	190.75	99.97	835.29	112	116
F-15SQT	2508.00	70.66	24.30	41.77	113.91	15	15
F-15ST	0.00	476.77	325.94	17.55	1515.65	367	393
F-16QT	0.00	304.76	168.32	106.71	706.52	125	129
F-16SQT	2311.00	67.13	21.91	42.37	114.56	17	17
F-16ST	0.00	537.46	312.34	114.44	1691.14	415	442

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 18-JUL-90 TIME: 07:00:12 REPT.ID: UFC 2ND PAGE: 5

DIRECT LABOR STATISTICS

ITEM	EXPECTED HOURS	STANDARD HOURS	SIMULATED AVERAGE LABOR HOURS	STANDARD DEVIATION	SIMULATED MINIMUM LABOR HOURS	SIMULATED MAXIMUM LABOR HOURS	NUMBER OF SAMPLES
AC	30.66	0.00	31.66	4.66	20.24	44.65	203

AC/DB	41.42	0.00	44.36	11.50	18.38	74.97	369
DB	11.91	0.00	14.12	3.58	9.92	18.65	4
F-15QT	89.15	0.00	95.30	18.64	56.67	145.43	112
F-15SQT	32.08	0.00	35.19	7.06	20.96	47.24	15
F-15ST	143.59	0.00	116.35	53.10	6.75	254.03	367
F-16QT	89.15	0.00	93.93	21.59	51.88	150.91	125
F-16SQT	32.08	0.00	34.44	7.49	23.74	46.67	17
F-16ST	135.75	0.00	137.28	41.97	35.67	289.04	415

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 18-JUL-90 TIME: 07:00:12 REPT.ID: UFC 2ND PAGE: 6

BACKSHOP DWELL SUMMARY

ITEM	AVERAGE SIMULATED BACKSHOP HOURS	STANDARD DEVIATION	SIMULATED MINIMUM BACKSHOP HOURS	SIMULATED MAXIMUM BACKSHOP HOURS	NUMBER OF SAMPLES
AC	0.00	0.00	0.00	0.00	203
AC/DB	0.00	0.00	0.00	0.00	369
DB	0.00	0.00	0.00	0.00	4
F-15QT	0.00	0.00	0.00	0.00	112
F-15SQT	0.00	0.00	0.00	0.00	15
F-15ST	0.00	0.00	0.00	0.00	367
F-16QT	0.00	0.00	0.00	0.00	125
F-16SQT	0.00	0.00	0.00	0.00	17
F-16ST	0.00	0.00	0.00	0.00	415

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 18-JUL-90 TIME: 07:00:12 REPT.ID: UFC 2ND PAGE: 7

PROCESS TIMES SUMMARY

ITEM	HISTOR. FLOW HOURS	SIMULATED FLOW HOURS	WAITING FOR RESOURCES HOURS	PROCESSING FLOW HOURS	BACKSHOP HOURS	NUMBER OF SAMPLES
AC	0.0	73.4	9.2	64.2	0.0	203
AC/DB	0.0	141.5	58.5	83.0	0.0	369
			12.5%	87.5%	0.0%	
			41.3%	58.7%	0.0%	

DB	0.0	38.4	0.0	0.0	0.0%	38.4	100.0%	0.0	0.0%
F-15QT	0.0	323.5	175.8	54.3%	0.0%	147.8	45.7%	0.0	0.0%
F-15SQT	2508.0	70.7	14.2	20.1%	0.0%	56.4	79.9%	0.0	0.0%
F-15ST	0.0	476.8	287.0	60.2%	0.0%	189.8	39.8%	0.0	0.0%
F-16QT	0.0	304.8	154.8	50.8%	0.0%	150.0	49.2%	0.0	0.0%
F-16SQT	2311.0	67.1	14.2	21.1%	0.0%	53.0	78.9%	0.0	0.0%
F-16ST	0.0	537.5	313.6	58.3%	0.0%	223.9	41.7%	0.0	0.0%

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 18-JUL-90 TIME: 07:00:12 REPT.ID: UFC 2ND PAGE: 8

RESOURCE QUEUE STATISTICS

RESOURCE QUEUE	AVERAGE QUEUE QUANTITY	STANDARD DEVIATION	MAXIMUM QUEUE QUANTITY	AVERAGE QUEUE WAIT (hrs)	CURRENT QUEUE QUANTITY	THE BLAKE STATISTIC
50002	EQ	0.00	0.20	52.00	14	0.00
50004	EQ	0.00	0.01	10.00	1	0.00
50005	EQ	0.00	0.00	0.00	0	0.00
50173	EQ	0.00	0.00	5.00	0	0.00
WG00	MP	4.98	5.49	30.00	17	10.22
WG09	MP	0.50	0.82	2.98	3	1.50
WG10	MP	3.49	4.12	1.84	0	6.44
WG11	MP	27.89	28.85	1.12	55	31.26
WGAA	MP	0.00	0.00	0.00	0	0.00

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 18-JUL-90 TIME: 07:00:12 REPT.ID: UFC 2ND PAGE: 9

ASSEMBLY STATISTICS

PARENT ITEM	TOTAL INDUCT	DELAYED OPERATIONS	WAIT (HOURS) AVERAGE	-----WAITING QUEUE COUNT----- AVERAGE STD.DEV. MAXIMUM CURRENT
AC/DB	721	205	73.5	1.7 1.3 7.0 3
F-15ST	393	145	138.9	2.3 1.8 9.0 1
F-16ST	442	226	143.4	3.7 2.1 10.0 3

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 18-JUL-90 TIME: 07:00:12 REPT.ID: UFC 2ND PAGE: 10

WORK IN PROCESS

ITEM	ALLOWABLE QUANTITY	AVERAGE	STD.DEV.	MINIMUM	MAXIMUM	CURRENT	AVERAGE WAITING TIME	AVERAGE QUANTITY WAITING	CURRENT QUANTITY WAITING
AC	99999	1.7	1.3	0	7	3	** NONE WAITED	**	**
AC/DB	99999	6.0	2.9	0	15	4	** NONE WAITED	**	**
DB	99999	0.0	0.1	0	1	0	** NONE WAITED	**	**
F-15QT	99999	4.3	3.1	0	12	5	** NONE WAITED	**	**
F-15SQT	99999	0.1	0.4	0	2	0	** NONE WAITED	**	**
F-15ST	99999	21.6	13.8	4	51	37	** NONE WAITED	**	**
F-16QT	99999	4.5	3.0	0	12	6	** NONE WAITED	**	**
F-16SQT	99999	0.1	0.4	0	2	0	** NONE WAITED	**	**
F-16ST	99999	27.2	16.0	0	65	42	** NONE WAITED	**	**

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 18-JUL-90 TIME: 07:00:12 REPT.ID: UFC 2ND PAGE: 11

DEDICATED STOCK STATISTICS - Parallel Operations

STOCK ITEM	TOTAL INDUCT	DELAYED OPERATIONS	WAIT (HOURS) AVERAGE	-----WAITING QUEUE COUNT----- AVERAGE STD.DEV. MAXIMUM CURRENT
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ALC: SA RCC: MATPFA QUARTER: 4 DATE: 18-JUL-90 TIME: 07:00:12 REPT.ID: UFC 2ND PAGE: 12

DEDICATED STOCK STATISTICS - Subcomponents

STOCK ITEM	TOTAL INDUCT	DELAYED OPERATIONS	WAIT (HOURS) AVERAGE	-----WAITING QUEUE COUNT----- AVERAGE STD.DEV. MAXIMUM CURRENT
AC	371	369	0.0	0.0 0.0 1.0 0
AC/DB	721	719	0.0	0.0 0.0 1.0 0
DB	205	205	58.8	1.4 1.2 6.0 3

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 18-JUL-90 TIME: 07:00:12 REPT.ID: UFC 2ND PAGE: 13

RESOURCE UTILIZATION by SHIFT

CODE COUNT	DESCRIPTION	SHIFT AVAIL.	NUMBER SHIFT UTIL.	---AVERAGE NUMBER IN EACH STATE---				---BATCHING---			
				IDLE	IN USE	PREV. MAINT.	FAILURE	OTHER DOWN	MIN SIZE	MAX SIZE	AVG SIZE
50002	50002	1	32.8	0.49	0.51	0.49	0.00	0.01	0.00		
		2	32.8	0.38	0.62	0.38	0.00	0.00	0.00		
		3	32.8	0.37	0.63	0.36	0.00	0.00	0.00		
		4	32.8	0.34	0.66	0.34	0.00	0.01	0.00		
		5	32.8	0.24	0.76	0.24	0.00	0.01	0.00		
		6	32.8	0.22	0.78	0.22	0.00	0.01	0.00		
50004	50004	1	9.8	0.27	0.73	0.27	0.00	0.01	0.00		
		2	9.8	0.19	0.80	0.19	0.00	0.00	0.00		
		3	9.8	0.12	0.88	0.12	0.00	0.00	0.00		
		4	9.8	0.23	0.77	0.23	0.00	0.01	0.00		
		5	9.8	0.16	0.84	0.16	0.00	0.00	0.00		
		6	9.8	0.10	0.89	0.10	0.00	0.01	0.00		
50005	50005	1	5.8	0.00	0.99	0.00	0.00	0.01	0.00		
		2	5.8	0.00	0.99	0.00	0.00	0.01	0.00		
		3	5.8	0.00	0.99	0.00	0.00	0.01	0.00		
		4	5.8	0.00	0.99	0.00	0.00	0.01	0.00		
		5	5.8	0.00	0.99	0.00	0.00	0.01	0.00		
		6	5.8	0.00	0.99	0.00	0.00	0.01	0.00		
50173	50173	1	16.8	0.03	0.97	0.03	0.00	0.00	0.00		
		2	16.8	0.03	0.97	0.03	0.00	0.00	0.00		
		3	16.8	0.02	0.98	0.02	0.00	0.00	0.00		
		4	16.8	0.00	1.00	0.00	0.00	0.00	0.00		
		5	16.8	0.00	1.00	0.00	0.00	0.00	0.00		
		6	16.8	0.00	1.00	0.00	0.00	0.00	0.00		
WG00	WG00	1	39.0	0.27	0.42	0.16	0.00	0.00	0.43		
		2	11.0	0.55	0.26	0.32	0.00	0.00	0.43		
		3	10.0	0.48	0.30	0.28	0.00	0.00	0.43		
		4	1.0	0.99	0.01	0.57	0.00	0.00	0.43		
		5	1.0	1.00	0.00	0.57	0.00	0.00	0.43		

WG09	WG09	6	0.0	NO VALUES RECORDED
		1	4.0	0.23 0.50 0.15 0.00 0.00 0.36
		2	2.5	0.29 0.46 0.19 0.00 0.00 0.36
		3	1.0	0.52 0.31 0.33 0.00 0.00 0.36
		4	0.0	NO VALUES RECORDED
		5	0.0	NO VALUES RECORDED
		6	0.0	NO VALUES RECORDED

Note: Remember that the utilizations reflect only 80% of the workload and the other 20% may not be spread evenly across all resources.

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 18-JUL-90 TIME: 07:00:12 REPT.ID: UFC 2ND PAGE: 14

RESOURCE UTILIZATION BY SHIFT

CODE COUNT	DESCRIPTION	SHIFT SHIFT AVAIL.	NUMBER SHIFT UTIL.	AVERAGE NUMBER IN EACH STATE			BATCHING		
				IDLE	PREV. IN USE	FAILURE MAINT.	MIN SIZE	MAX SIZE	AVG SIZE
WG10	WG10	1	8.8	0.61	0.33	0.52	0.00	0.00	0.15
		2	4.5	0.82	0.15	0.70	0.00	0.00	0.15
		3	2.0	0.97	0.03	0.82	0.00	0.00	0.15
		4	6.0	0.78	0.18	0.67	0.00	0.00	0.15
		5	4.0	0.82	0.15	0.70	0.00	0.00	0.15
		6	2.0	0.91	0.08	0.77	0.00	0.00	0.15
WG11	WG11	1	21.0	0.80	0.17	0.68	0.00	0.00	0.15
		2	14.3	0.91	0.08	0.77	0.00	0.00	0.15
		3	14.3	0.91	0.08	0.77	0.00	0.00	0.15
		4	12.0	0.91	0.07	0.78	0.00	0.00	0.15
		5	8.0	0.96	0.04	0.81	0.00	0.00	0.15
		6	8.0	0.94	0.05	0.80	0.00	0.00	0.15
WGAA	WGAA	1	4.0	0.00	0.64	0.00	0.00	0.00	0.36
		2	2.5	0.00	0.64	0.00	0.00	0.00	0.36
		3	1.0	0.00	0.64	0.00	0.00	0.00	0.36
		4	0.0	NO VALUES RECORDED					

5 0.0 NO VALUES RECORDED
6 0.0 NO VALUES RECORDED

Note: Remember that the utilizations reflect
only 80% of the workload and the other
20% may not be spread evenly across all
resources

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 18-JUL-90 TIME: 07:00:12 REPT.ID: UFC 2ND PAGE: 15

ITEM NAME: AC WCD NAME: SLOTHRU5

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL QTY	PROCESSED QTY	QUEUED QTY	QUEUED HRS	AVERAGE SCHEDULED HRS	AVERAGE SIMULATED HRS	DESC	RCC	OCC FAC
0100	205.	205.	7.	31.01	3.73	6.50	ASSY	MATPFA	1.00 WG00
0200	205.	205.	0.	0.00	7.13	16.17	REP	MATPFA	1.00
0300 S	205.	155.	41.	14.26	1.95	3.37	TEST	MATPFA	0.75 WG09,50173
0400	204.	156.	21.	12.56	4.04	7.39	TEST	MATPFA	0.75 WG09,50173
0500	204.	154.	25.	1.76	4.50	9.02	ASSY	MATPFA	0.75 WG00
0600 S	204.	204.	56.	8.36	1.97	4.24	TEST	MATPFA	1.00 WG09,50173
0700	204.	204.	21.	9.73	8.81	16.21	TEST	MATPFA	1.00 WG09,50173
0800	203.	203.	50.	1.74	3.54	6.09	ASSY	MATPFA	1.00 WG00,as

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 18-JUL-90 TIME: 07:00:12 REPT.ID: UFC 2ND PAGE: 16

ITEM NAME: AC/DB WCD NAME: SLOTHRU4

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL QTY	PROCESSED QTY	QUEUED QTY	QUEUED HRS	AVERAGE SCHEDULED HRS	AVERAGE SIMULATED HRS	DESC	RCC	OCC FAC
0100	371.	371.	24.	5.13	6.09	11.98	REP	MATPFA	1.00 WG00

080139

0200 371. 371. 0. 0.00 3.67 7.96 ASSY MATPFA 1.00
0300 371. 371. 203. 73.79 3.59 7.22 ASSY MATPFA 1.00 WG00,as
0400 S 369. 369. 236. 20.47 3.59 4.41 TEST MATPFA 1.00 WG10,50002
0500 369. 369. 105. 16.42 34.34 51.45 TEST MATPFA 1.00 WG10,50002

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 18-JUL-90 TIME: 07:00:12 REPT.ID: UFC 2ND PAGE: 17

ITEM NAME: DB WCD NAME: SLOTHRU6

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL PROCESSED		QUEUED QTY	QUEUED HRS	AVERAGE SCHEDULED		AVERAGE SIMULATED	DESC	RCC		OCC FAC
	QTY	QTY			HRS	HRS					
0100	4.	4.	0.	0.00	4.24	7.64	REP	MATPFA	1.00		
0200 S	4.	4.	0.	0.00	1.88	4.53	TEST	MATPFA	1.00		
0300	4.	4.	0.	0.00	9.62	26.27	TEST	MATPFA	1.00		

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 18-JUL-90 TIME: 07:00:12 REPT.ID: UFC 2ND PAGE: 18

ITEM NAME: F-15QT WCD NAME: QUIKTHRU

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL PROCESSED		QUEUED QTY	QUEUED HRS	AVERAGE SCHEDULED		AVERAGE SIMULATED	DESC	RCC		OCC FAC
	QTY	QTY			HRS	HRS					
0000	116.	116.	0.	0.00	2.00	2.00	IN	MATPFA	1.00		
0100	116.	116.	116.	1.40	5.30	8.70	INSP	MATPFA	1.00		WG00
0200 S	116.	116.	86.	87.38	7.93	8.84	TEST	MATPFA	1.00		WG11,50002
0300	114.	114.	42.	87.50	22.55	26.49	TEST	MATPFA	1.00		WG11,50002
0400	114.	26.	13.	81.20	24.03	29.59	TEST	MATPFA	0.28		WG11,50002
0500	114.	114.	43.	93.17	42.27	55.32	TEST	MATPFA	1.00		WG11,50002
0600	114.	114.	31.	93.80	21.97	26.19	TEST	MATPFA	1.00		WG11,50002
0700	112.	112.	60.	14.80	5.47	9.31	PACK	MATPFA	1.00		WG00
9999	112.	112.	0.	0.00	4.00	4.00	OUT	MATPFA	1.00		

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 18-JUL-90 TIME: 07:00:12 REPT.ID: UFC 2ND PAGE: 19

ITEM NAME: F-15SQT WCD NAME: SUPQTHRU

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL QTY	PROCESSED QTY	QUEUED QTY	QUEUED HRS	AVERAGE SCHEDULED HRS	AVERAGE SIMULATED HRS	DESC	RCC	OCC FAC
0000	15.	15.	0.	0.00	2.00	2.00	IN	MATPFA	1.00
0100	15.	15.	10.	6.50	5.30	5.94	INSP	MATPFA	1.00
0200 S	15.	15.	0.	0.00	7.79	9.23	TEST	MATPFA	1.00
0300	15.	15.	6.	4.49	21.50	24.30	TEST	MATPFA	1.00
0400	15.	15.	10.	12.14	6.26	10.96	PACK	MATPFA	1.00
9999	15.	15.	0.	0.00	4.00	4.00	OUT	MATPFA	1.00

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 18-JUL-90 TIME: 07:00:12 REPT.ID: UFC 2ND PAGE: 20

ITEM NAME: F-15ST WCD NAME: SLOTHRUI

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL QTY	PROCESSED QTY	QUEUED QTY	QUEUED HRS	AVERAGE SCHEDULED HRS	AVERAGE SIMULATED HRS	DESC	RCC	OCC FAC
0000	393.	393.	0.	0.00	2.00	2.00	IN	MATPFA	1.00
0100	393.	393.	393.	1.40	5.30	8.70	INSP	MATPFA	1.00

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 18-JUL-90 TIME: 07:00:12 REPT.ID: UFC 2ND PAGE: 21

ITEM NAME: F-15ST WCD NAME: SLOTHRU0

WCD by OPERATION STATISTIC AVERAGES

171680

OPER CODE	POTENTIAL PROCESSED		QUEUED		AVERAGE SCHEDULED		AVERAGE SIMULATED		OCC	
	QTY	QTY	QTY	HRS	HRS	HRS	HRS	DESC	RCC	FAC
0100 S	285.	285.	213.	91.62	7.81	8.73	TEST	MATPFA	1.00	WG11,50002
0200	281.	281.	105.	102.14	23.11	27.19	TEST	MATPFA	1.00	WG11,50002
0300	278.	51.	22.	93.07	25.35	30.34	TEST	MATPFA	0.19	WG11,50002
0400	276.	120.	45.	80.54	41.15	54.28	TEST	MATPFA	0.46	WG11,50002
0500	277.	69.	31.	64.25	22.50	26.37	TEST	MATPFA	0.30	WG11,50002

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 18-JUL-90 TIME: 07:00:12 REPT.ID: UFC 2ND PAGE: 22

ITEM NAME: F-15ST WCD NAME: SLOTHRU1

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL PROCESSED		QUEUED		AVERAGE SCHEDULED		AVERAGE SIMULATED		OCC	
	QTY	QTY	QTY	HRS	HRS	HRS	HRS	DESC	RCC	FAC
0100	76.	76.	33.	17.83	1.50	1.99	REP	MATPFA	1.00	WG00
0200 S	76.	76.	53.	76.48	7.82	8.92	TEST	MATPFA	1.00	WG11,50002
0300	74.	50.	25.	72.49	42.00	53.49	TEST	MATPFA	0.75	WG11,50002

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 18-JUL-90 TIME: 07:00:12 REPT.ID: UFC 2ND PAGE: 23

ITEM NAME: F-15ST WCD NAME: SLOTHRU2

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL PROCESSED		QUEUED		AVERAGE SCHEDULED		AVERAGE SIMULATED		OCC	
	QTY	QTY	QTY	HRS	HRS	HRS	HRS	DESC	RCC	FAC
0100	294.	150.	69.	13.24	3.02	4.61	REP	MATPFA	0.50	WG00
0200 S	293.	158.	101.	21.40	8.80	10.67	TEST	MATPFA	0.50	WG10,50004
0300	293.	151.	71.	19.46	40.61	60.81	TEST	MATPFA	0.50	WG10,50004
0600	293.	293.	141.	14.17	3.91	6.54	ASSY	MATPFA	1.00	WG00

080142

0700	289.	289.	147.	147.95	3.41	5.57	ASSY	MATPFA	1.00	WG00, as
0800 S	291.	291.	206.	97.09	13.43	15.17	TEST	MATPFA	1.00	WG11, 50002
0900	283.	283.	113.	84.12	42.43	54.76	TEST	MATPFA	1.00	WG11, 50002
1000	279.	206.	90.	103.12	21.08	24.52	TEST	MATPFA	0.75	WG11, 50002

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 18-JUL-90 TIME: 07:00:12 REPT.ID: UFC 2ND PAGE: 24

ITEM NAME: F-15ST WCD NAME: SLOTHRU3

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL QTY	PROCESSED QTY	QUEUED QTY	QUEUED HRS	AVERAGE SCHEDULED HRS	AVERAGE SIMULATED HRS	DESC	RCC	OCC
0100	366.	366.	195.	13.69	5.49	9.95	PACK	MATPFA	1.00
9999	367.	367.	0.	0.00	4.00	4.00	OUT	MATPFA	1.00

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 18-JUL-90 TIME: 07:00:12 REPT.ID: UFC 2ND PAGE: 25

ITEM NAME: F-16QT WCD NAME: QUIKTHRU

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL QTY	PROCESSED QTY	QUEUED QTY	QUEUED HRS	AVERAGE SCHEDULED HRS	AVERAGE SIMULATED HRS	DESC	RCC	OCC
0000	129.	129.	0.	0.00	2.00	2.00	IN	MATPFA	1.00
0100	129.	129.	129.	1.40	5.30	8.70	INSP	MATPFA	1.00
0200 S	129.	129.	103.	79.09	7.72	8.60	TEST	MATPFA	1.00
0300	129.	129.	39.	76.04	23.05	27.44	TEST	MATPFA	1.00
0400	128.	33.	10.	70.07	25.61	31.63	TEST	MATPFA	0.28
0500	128.	128.	46.	73.10	42.94	57.05	TEST	MATPFA	1.00
0600	126.	126.	51.	79.23	21.07	24.74	TEST	MATPFA	1.00
0700	124.	124.	60.	11.81	5.52	9.01	PACK	MATPFA	1.00
9999	125.	125.	0.	0.00	4.00	4.00	OUT	MATPFA	1.00

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 18-JUL-90 TIME: 07:00:12 REPT.ID: UFC 2ND PAGE: 26

ITEM NAME: F-16SQT WCD NAME: SUPQTHRU

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL QTY	PROCESSED QTY	QUEUED QTY	QUEUED HRS	AVERAGE SCHEDULED HRS	AVERAGE SIMULATED HRS	DESC	RCC	OCC FAC
0000	17.	17.	0.	0.00	2.00	2.00	IN	MATPFA	1.00
0100	17.	17.	10.	4.45	5.30	6.01	INSP	MATPFA	1.00
0200 S	17.	17.	0.	0.00	7.58	8.78	TEST	MATPFA	1.00
0300	17.	17.	5.	5.77	20.70	23.88	TEST	MATPFA	1.00
0400	17.	17.	11.	15.24	5.22	8.29	PACK	MATPFA	1.00
9999	17.	17.	0.	0.00	4.00	4.00	OUT	MATPFA	1.00

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 18-JUL-90 TIME: 07:00:12 REPT.ID: UFC 2ND PAGE: 27

ITEM NAME: F-16ST WCD NAME: SLOTHRUI

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL QTY	PROCESSED QTY	QUEUED QTY	QUEUED HRS	AVERAGE SCHEDULED HRS	AVERAGE SIMULATED HRS	DESC	RCC	OCC FAC
0000	442.	442.	0.	0.00	2.00	2.00	IN	MATPFA	1.00
0100	442.	442.	442.	1.40	5.30	8.71	INSP	MATPFA	1.00

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 18-JUL-90 TIME: 07:00:12 REPT.ID: UFC 2ND PAGE: 28

ITEM NAME: F-16ST WCD NAME: SLOTHRUO

WCD by OPERATION STATISTIC AVERAGES

AVERAGE AVERAGE

OPER CODE	POTENTIAL PROCESSED		QUEUED QTY	QUEUED HRS	SCHEDULED HRS	SIMULATED HRS	DESC	RCC	OCC	
	QTY	QTY							FAC	FAC
0100 S	316.	316.	260.	82.15	7.83	8.78	TEST	MATPFA	1.00	WG11,50002
0200	309.	309.	111.	90.87	22.43	26.56	TEST	MATPFA	1.00	WG11,50002
0300	306.	61.	23.	74.45	25.19	30.84	TEST	MATPFA	0.19	WG11,50002
0400	305.	143.	60.	84.65	43.68	58.52	TEST	MATPFA	0.46	WG11,50002
0500	307.	104.	43.	78.44	20.78	24.39	TEST	MATPFA	0.30	WG11,50002

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 18-JUL-90 TIME: 07:00:12 REPT.ID: UFC 2ND PAGE: 29

ITEM NAME: F-16ST WCD NAME: SLOTHRU2

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL PROCESSED		QUEUED QTY	QUEUED HRS	AVERAGE		DESC	RCC	OCC	
	QTY	QTY			SCHEDULED HRS	SIMULATED HRS			FAC	FAC
0100	433.	228.	98.	13.32	2.99	4.36	REP	MATPFA	0.50	WG00
0200 S	433.	215.	129.	21.28	8.69	10.77	TEST	MATPFA	0.50	WG10,50004
0300	433.	237.	131.	19.37	40.60	60.55	TEST	MATPFA	0.50	WG10,50004
0600	434.	434.	213.	15.26	3.88	6.41	ASSY	MATPFA	1.00	WG00
0700	432.	432.	223.	154.68	3.60	6.48	ASSY	MATPFA	1.00	WG00,as
0800 S	428.	428.	305.	85.07	13.47	15.19	TEST	MATPFA	1.00	WG11,50002
0900	423.	423.	179.	77.76	42.70	55.99	TEST	MATPFA	1.00	WG11,50002
1000	418.	326.	112.	86.92	21.48	25.24	TEST	MATPFA	0.75	WG11,50002

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 18-JUL-90 TIME: 07:00:12 REPT.ID: UFC 2ND PAGE: 30

ITEM NAME: F-16ST WCD NAME: SLOTHRU3

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL PROCESSED		QUEUED QTY	QUEUED HRS	AVERAGE		DESC	RCC	OCC	
	QTY	QTY			SCHEDULED HRS	SIMULATED HRS			FAC	FAC

0100 415. 415. 227. 14.89 5.40 10.10 PACK MATPFA 1.00 WG00
9999 415. 415. 0. 0.00 4.00 4.00 OUT MATPFA 1.00

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 18-JUL-90 TIME: 07:00:12 REPT.ID: UFC 2ND PAGE: 31

BACKSHOP DWELL TIMES BY BACKSHOP RCC

ITEM	RCC	AVERAGE HOURS
AC	*** NO BACKSHOP ACTIVITY	*****
AC/DB	*** NO BACKSHOP ACTIVITY	*****
DB	*** NO BACKSHOP ACTIVITY	*****
F-15QT	*** NO BACKSHOP ACTIVITY	*****
F-15SQT	*** NO BACKSHOP ACTIVITY	*****
F-15ST	*** NO BACKSHOP ACTIVITY	*****
F-16QT	*** NO BACKSHOP ACTIVITY	*****
F-16SQT	*** NO BACKSHOP ACTIVITY	*****
F-16ST	*** NO BACKSHOP ACTIVITY	*****

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 18-JUL-90 TIME: 07:00:12 REPT.ID: UFC 2ND PAGE: 32

HISTORICAL vs. SIMULATED COMPARISON

ITEM	HISTORICAL VALUES			SIMULATED VALUES			PERCENTAGE	
	FLOWTIME HOURS	STANDARD DEVIATION	SAMPLE SIZE	FLOWTIME HOURS	STANDARD DEVIATION	SAMPLE SIZE	WORKLOAD WEIGHT	DIFFERENCE

AC	0.00	0.00	0	73.40	23.38	203	0.000	0.00
AC/DB	0.00	0.00	0	141.50	53.25	369	0.000	0.00
DB	0.00	0.00	0	38.44	22.17	4	0.000	0.00
F-15QT	0.00	0.00	0	323.53	190.75	112	0.000	0.00
F-15SQT	2508.00	3566.00	80	70.66	24.30	15	0.000	97.18
F-15ST	0.00	0.00	0	476.77	325.94	367	0.000	0.00
F-16QT	0.00	0.00	0	304.76	168.32	125	0.000	0.00
F-16SQT	2311.00	2606.00	67	67.13	21.91	17	0.000	97.10
F-16ST	0.00	0.00	0	537.46	312.34	415	0.000	0.00

ITEM AC EXCLUDED FROM VALIDATION TEST DUE TO INSUFFICIENT DATA

ITEM AC/DB EXCLUDED FROM VALIDATION TEST DUE TO INSUFFICIENT DATA

ITEM DB EXCLUDED FROM VALIDATION TEST DUE TO INSUFFICIENT DATA

ITEM F-15QT EXCLUDED FROM VALIDATION TEST DUE TO INSUFFICIENT DATA

ITEM F-15ST EXCLUDED FROM VALIDATION TEST DUE TO INSUFFICIENT DATA

ITEM F-16QT EXCLUDED FROM VALIDATION TEST DUE TO INSUFFICIENT DATA

ITEM F-16ST EXCLUDED FROM VALIDATION TEST DUE TO INSUFFICIENT DATA

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EMPLOYEE

L. T. V. ROMAN

DATE

7-22 to 7-29-90

PAGE NO.

RCC

SUBJECT

UFC model, etc.

WEEK OF 7-22 to 7-29-90

UFC WORKED ON A 3RD CUT OF THE UFC area model. Some cycling times and occurrences on the

branching were added to the model. The model was run and the results were briefed to production personnel. Since it was felt that people only had a vague notion of what the model was & what we were doing with the data, the purpose of the meeting was to familiarize them with the model and some of the outputs. Charts of some of the outputs so they were easier to understand.

The outputs and charts are included in the report.

VTCN - a longed approach to modeling and data collection was briefly discussed. Some of the working group members seemed confused as to what it was and why it was being done. A short meeting is indicated to help clarify the concept.

GTE'S - Met with Dan Gonzalez and discussed the modeling approach to be taken. Also discussed a little about tracking system to come on-line later in the year.

[Further comments said time, say later, that the system are raised throughout the time]. Met with the key people and set up a briefing schedule.

DATE: JULY 30, 1990

SUBJ: LAYERED MODELING APPROACH

It is important to get feedback on the data being collected as we go along, not after it is done. In order to do this we need to look at the area from a higher level first, going into more detail as we go along. The following is a suggested plan which is roughly being followed in the UFC area at San Antonio. The method is proving successful. A similar approach was used at Sacramento last year and was successful there also.

1. Develop workload profile - identify all items, give them names.

- get induction data by quarters
- get standard flow days
- get historical data - even if not good
- get average flow days from some source such as log books that contain

real flow days.

- get names if any of WCDs
- get standard manhours for a part in a given area
- get overall interview manhours for a part in a given area

1.5 Hold meeting w/ALC personnel to review the data collected in 1. Make sure everyone can agree to the data collected in 1 [or at least agree to the limitations in the data, such as standard flow days] before going on.

At this point, you have the work defined - you know how many items and WCDs to profile. You have a good picture of how long parts take and about how many manhours are needed to do the work. The information may not be perfect, but you at least have a ballpark figure.

2. Develop resource profile

- identify resources & quantities
- get p.m. & failure data, other down
- identify alternates
- ask about overtime & put into resource file
- get estimates of resource utilization

3. Develop first cut ops profiles -

- the WCDs have 1 operation - standard manhours/item. If you can break standard hours into different manhour categories, good, if not make all manpower resources one type.
- do the same with "total manhours/part" through interview time.

3.1 Produce flat files and run through usage report for both standard and interview times.

The purpose of this is to see if the work can be done - if there even enough hours in a year for the men to produce the parts. If not, then adjust the overall manhours for that part. It may be hard to get people to agree to a defined number of manhours/part, but you at least have an idea if the part requires 5 hours or 150 hours of touch time.

080148

- 3.2 Meet with ALC folks to discuss results and agree upon a set of numbers. This will set the number of manhours/item.

4.0 If possible do 3 with the equipment. This could be tough in some areas, but if they have an overall idea of how many hours a part resides on a machine, then use that figure.

5.0 Now you have data needed for feedback - set manhours/part allows interview times to be compared to it as they are being developed. Projected resource utilization will let you know if interview etc. times are close. Use the usage report frequently to get feedback on the data being collected.

6.0 Make a Matrix - resources on one side, parts on the other. Showing total hours available & total hours used by part along with %'s. Update it as ops profiles are entered. Remember to take into account other time & batching considerations.

- 7.0 Now the next lower level of detail can be made on ops profile. Divide WCDs into major area or stations, such as Inspect, repair, disassembly, etc. Even if area or station will be broken down into further operations later - group into major areas.
- get overall time by area, for all manpower & equipment, used in that area.
 - make each area one operation.

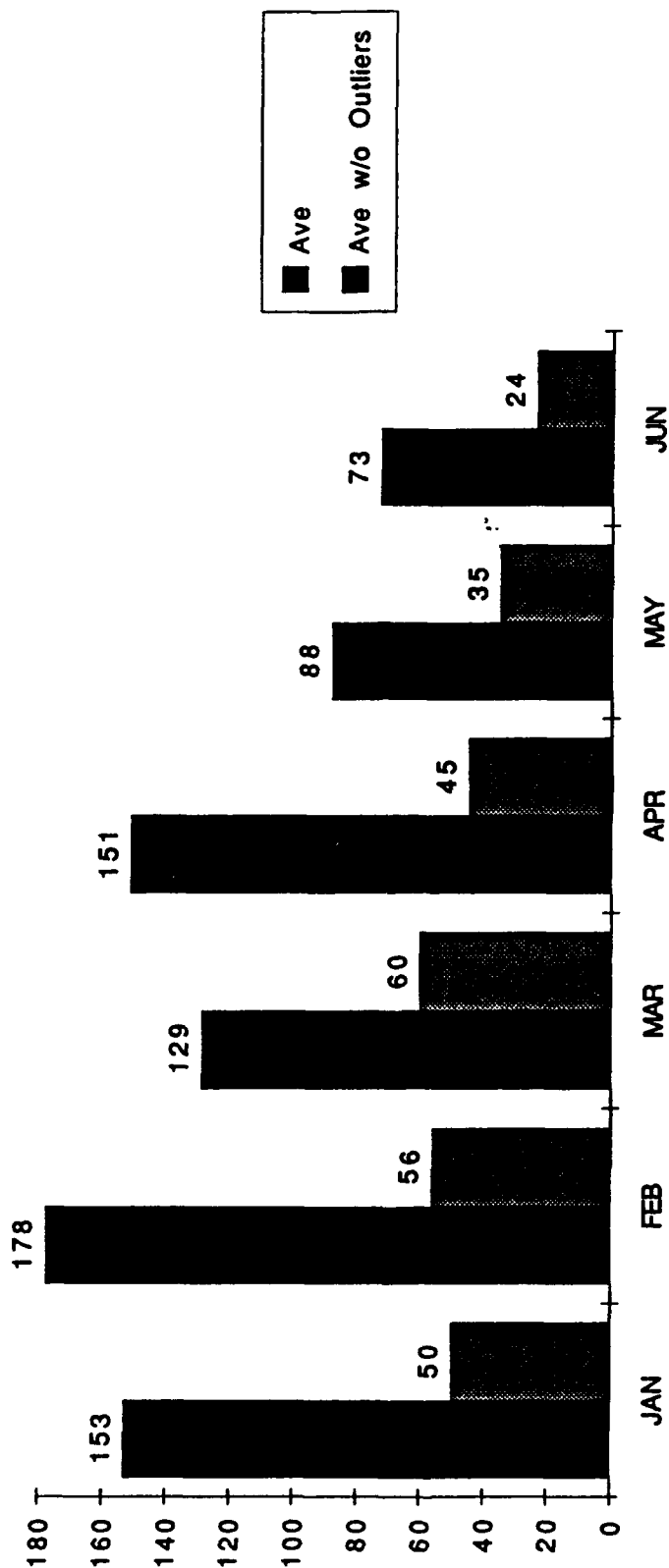
Go through the same method above, producing flat files and running through the usage report. At this point the files can be run through UDOS if desired to see effects that are not shown by the usage report.

7.X Keep going through this method refining the data until an acceptable level of detail is reached. It is important to keep everyone informed of the progress and the current structure of the model. This way, there are no surprises come validation. Everyone is aware of what is going on and have accepted the results along the way.

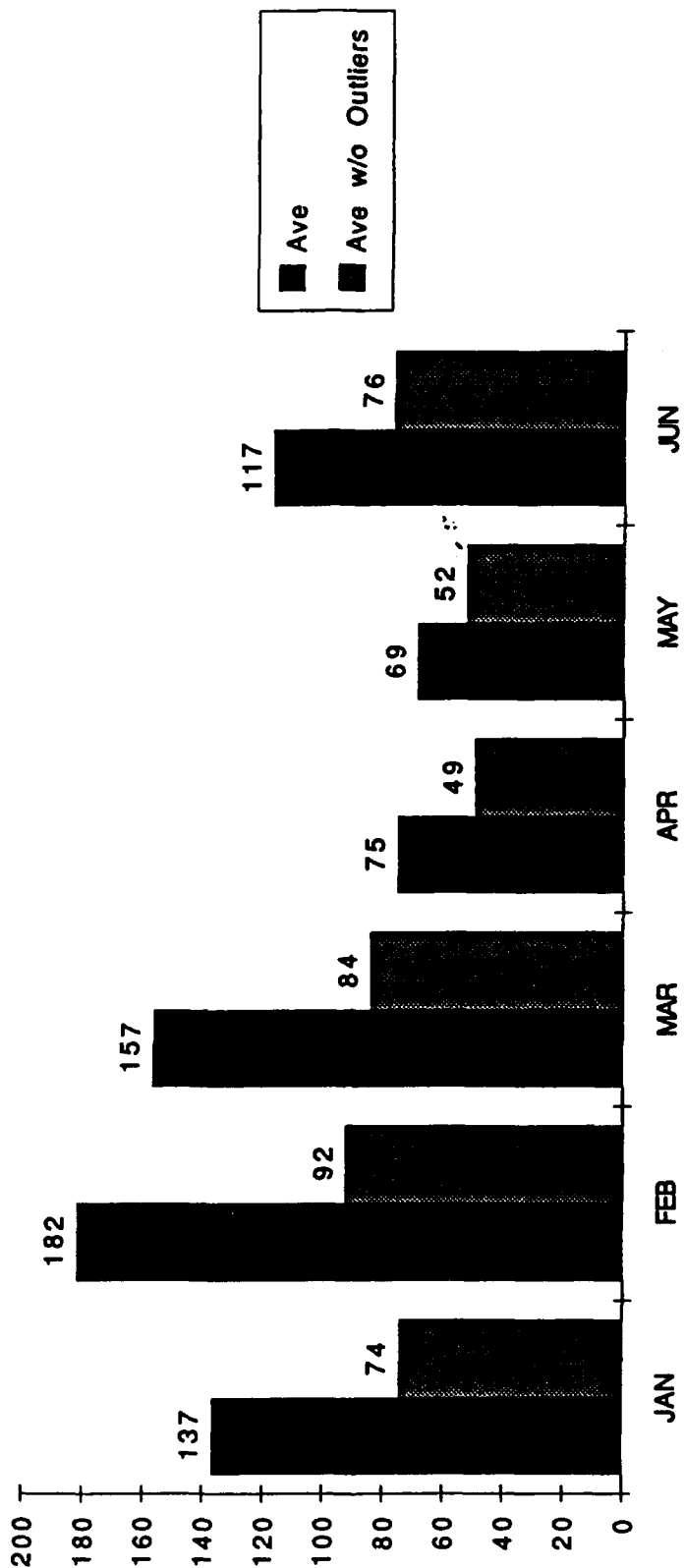
Note: The resources in the operations can be substituted with a mandatory flow times [obtained from history or what ever] if you just want to get an idea of where the critical path lies. This is particularly useful when an item breaks down into many subcomponents and the flow through a lot of different areas.

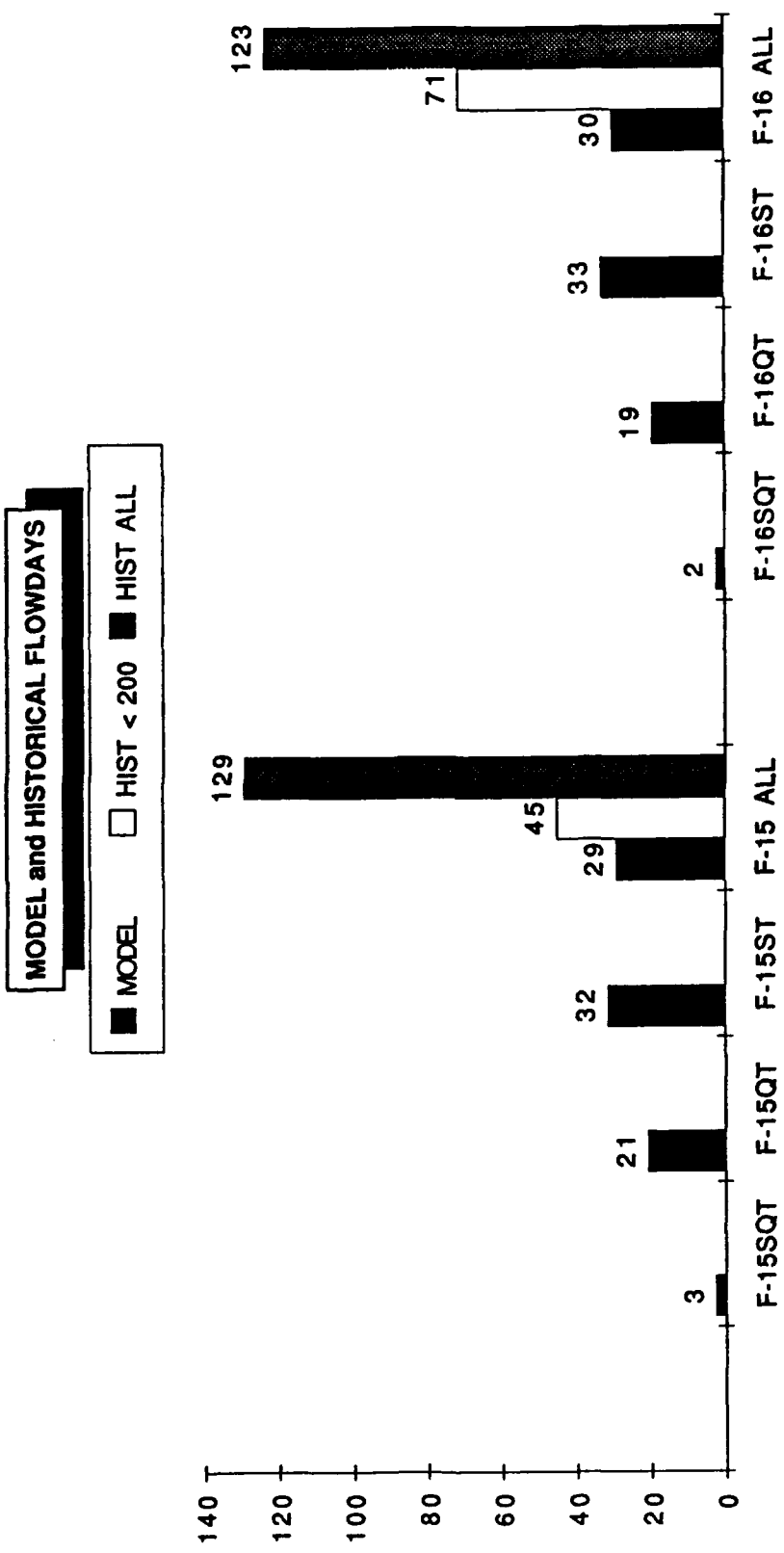
The above method are not hard and fast rules that can be applied everywhere - it may not be as useful in TO14 [cleaning line] for example. The general approach of providing feedback to the both the data collector and ALC personnel is useful anywhere.

F-15 FLOWDAYS

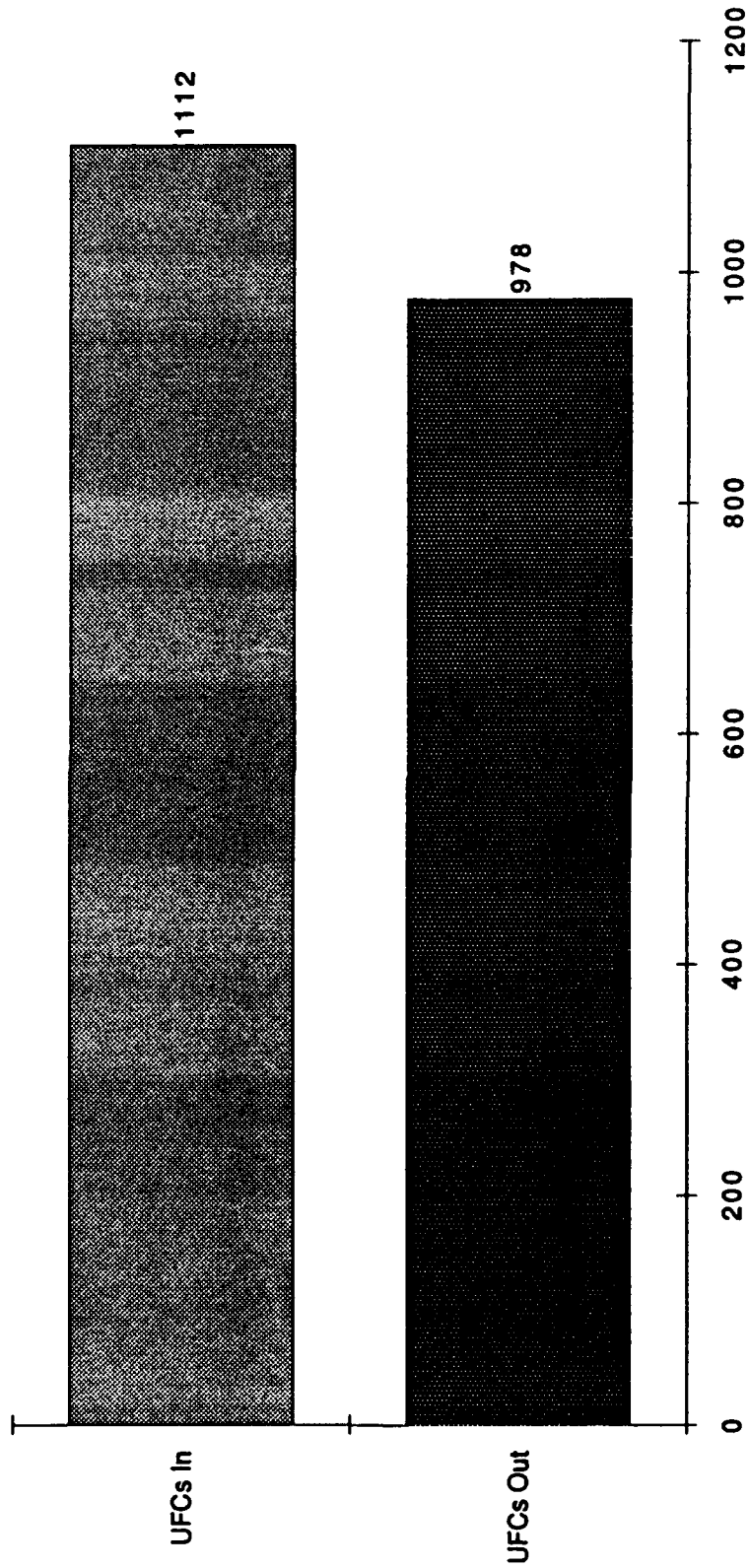


F-16 FLOWDAYS



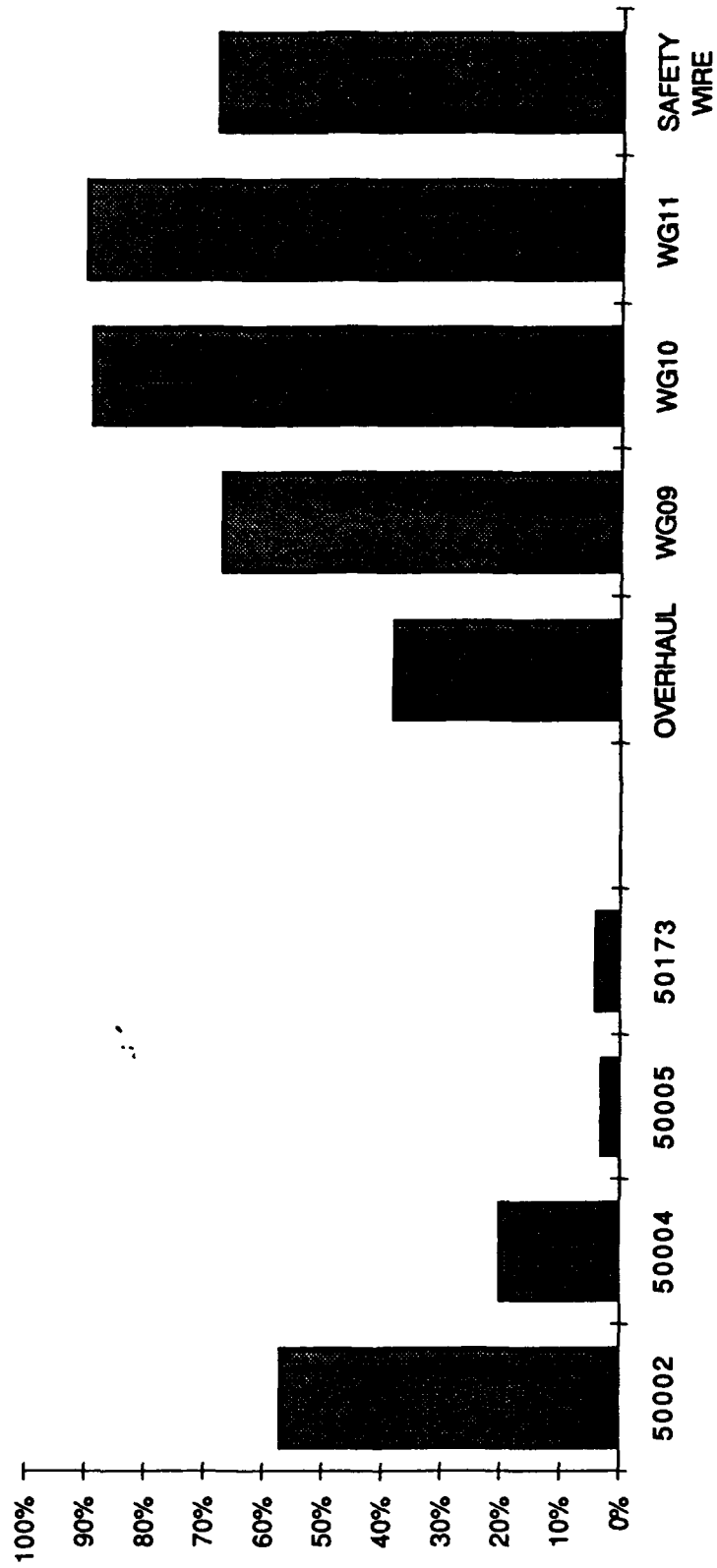


Number In vs Number Out



080153

MANPOWER AND EQUIPMENT UTILIZATION



080154

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 26-JUL-90 TIME: 12:57:36 REPT.ID: UFC 3rd PAGE: 1

RUN PARAMETERS

UDOS :
THIS JOB WAS RAN ON AFTIES, A VAX OF ENPOWERMENT.

ALC: SA

RCC: MATPFA

REPORT ID: UFC 3rd

THIS RUN IS FOR THE LOW LEVEL 3rd CUT OF THE UFC AREA

PART FILE: UFC3PART.DAT
RES FILE: UFC3RES.DAT
OPER FILE: UFC3OPS.DAT
ETC FILE: UFC3ETC.DAT

WEEKENDS = Y

NUMBER OF QUARTERS = 4

WARM UP PERIOD; STATS WILL BE CLEARED AT DAY 91

OF HOLIDAYS 0

HISTORICAL DATA SHIFT FACTOR 8.000000

BACKSHOP DATA SHIFT FACTOR 24.000000

NEW DATA FORMATS SELECTED

SIMULATION CPU TIME: 23.81 MINUTES
SIMULATION LAPSE TIME: 23.97 MINUTES

SIMULATION RUN LENGTH: 10920.00 HOURS

Number of Items : 10
Number of Resources : 9
Number of WCDs : 17
Number of Operations : 72
Operations completed : 22410

080015

ALC: S. RCC: MATPFA QUARTER: 4 DATE: 26-JUL-90 TIME: 12:57:36 REPT.ID: UFC 3rd PAGE: 2

ITEM INDUCTIONS

	1ST QTR	2ND QTR	3RD QTR	4TH QTR	YTD	
INDUCTIONS OF ITEM AC	105	67	100	104	376	(MISTR)
INDUCTIONS OF ITEM AC/DB	212	138	195	201	746	(MISTR)
INDUCTIONS OF ITEM DB	49	34	51	53	187	(MISTR)
INDUCTIONS OF ITEM F-15QT	23	23	39	31	116	(MISTR)
INDUCTIONS OF ITEM F-15SQT	1	1	1	1	4	(MISTR)
INDUCTIONS OF ITEM F-15ST	80	80	136	108	404	(MISTR)
INDUCTIONS OF ITEM F-16QT	41	17	40	31	129	(MISTR)
INDUCTIONS OF ITEM F-16SQT	1	1	1	1	4	(MISTR)
INDUCTIONS OF ITEM F-16ST	146	59	140	110	455	(MISTR)
INDUCTIONS OF ITEM GG	208	136	203	196	743	(MISTR)

TOTAL ITEM INDUCTIONS : 866 556 906 836 3164

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 26-JUL-90 TIME: 12:57:36 REPT.ID: UFC 3rd PAGE: 3

WCD INDUCTIONS

	1ST QTR	2ND QTR	3RD QTR	4TH QTR	YTD	
INDUCTIONS OF WCD	49	35	51	52	187	
INDUCTIONS OF WCD	104	67	103	103	377	
INDUCTIONS OF WCD	3	1	0	1	5	
INDUCTIONS OF WCD	23	23	39	31	116	
INDUCTIONS OF WCD	1	1	1	1	4	
INDUCTIONS OF WCD	80	80	136	108	404	
INDUCTIONS OF WCD	58	52	102	80	292	
INDUCTIONS OF WCD	20	19	26	22	87	
INDUCTIONS OF WCD	68	68	88	84	308	
INDUCTIONS OF WCD	82	88	80	106	356	
INDUCTIONS OF WCD	41	17	40	31	129	
INDUCTIONS OF WCD	1	1	1	1	4	
INDUCTIONS OF WCD	146	59	140	110	455	
INDUCTIONS OF WCD	101	36	101	74	312	
INDUCTIONS OF WCD	140	68	115	112	435	
INDUCTIONS OF WCD	140	86	78	116	420	
INDUCTIONS OF WCD	208	136	203	196	743	

TOTAL WCD INDUCTIONS : 1265 837 1304 1228 4634

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 26-JUL-90 TIME: 12:57:36 REPT.ID: UFC 3rd PAGE: 4

0800136

FLOW CYCLE TIME STATISTICS

ITEM	HISTORICAL FLOWTIME HOURS	AVERAGE SIMULATED FLOW TIME HOURS	STANDARD DEVIATION	SIMULATED MINIMUM FLOW TIME HOURS	SIMULATED MAXIMUM FLOW TIME HOURS	NUMBER OF SAMPLES	NUMBER OF INDUCTIONS
AC	0.00	80.39	25.95	34.89	149.59	184	376
AC/DB	0.00	173.41	74.93	21.26	435.34	375	746
DB	0.00	36.93	18.96	23.50	69.73	5	187
F-15QT	0.00	499.78	417.01	89.81	1864.32	102	116
F-15SQT	2508.00	68.00	25.83	48.18	105.99	4	4
F-15ST	0.00	756.99	562.82	24.92	2688.59	341	404
F-16QT	0.00	465.33	363.41	123.22	1618.32	120	129
F-16SQT	2311.00	55.30	15.57	40.76	71.41	4	4
F-16ST	0.00	790.12	513.14	161.07	2481.64	407	455
GG	0.00	76.70	58.06	1.09	355.67	664	743
ALC: SA	RCC: MATPFA	QUARTER: 4	DATE: 26-JUL-90	TIME: 12:57:36	REPT.ID: UFC 3rd	PAGE: 5	

DIRECT LABOR STATISTICS

ITEM	EXPECTED HOURS	STANDARD HOURS	SIMULATED AVERAGE LABOR HOURS	STANDARD DEVIATION	SIMULATED MINIMUM LABOR HOURS	SIMULATED MAXIMUM LABOR HOURS	NUMBER OF SAMPLES
AC	32.27	0.00	33.74	5.84	21.12	59.16	184
AC/DB	44.87	0.00	45.60	17.52	11.13	124.37	375
DB	12.50	0.00	13.64	1.17	11.85	15.04	5
F-15QT	89.22	0.00	93.22	20.12	47.14	149.69	102
F-15SQT	32.15	0.00	32.43	7.06	26.93	42.75	4
F-15ST	129.69	0.00	111.61	46.56	9.27	285.96	341
F-16QT	89.22	0.00	94.26	19.45	53.67	147.09	120
F-16SQT	32.15	0.00	30.70	9.65	21.75	44.33	4
F-16ST	121.29	0.00	115.46	36.84	35.99	214.64	407
GG	22.13	0.00	28.64	22.10	0.66	113.24	664
ALC: SA	RCC: MATPFA	QUARTER: 4	DATE: 26-JUL-90	TIME: 12:57:36	REPT.ID: UFC 3rd	PAGE: 6	

BACKSHOP DWELL SUMMARY

0800157

ITEM	BACKSHOP HOURS	STANDARD DEVIATION	BACKSHOP HOURS	BACKSHOP HOURS	OF SAMPLES
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AC	0.00	0.00	0.00	0.00	184
AC/DB	0.00	0.00	0.00	0.00	375
DB	0.00	0.00	0.00	0.00	5
F-15QT	0.00	0.00	0.00	0.00	102
F-15SQT	0.00	0.00	0.00	0.00	4
F-15ST	0.00	0.00	0.00	0.00	341
F-16QT	0.00	0.00	0.00	0.00	120
F-16SQT	0.00	0.00	0.00	0.00	4
F-16ST	0.00	0.00	0.00	0.00	407
GG	0.00	0.00	0.00	0.00	664

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 26-JUL-90 TIME: 12:57:36 REPT.ID: UFC 3rd PAGE: 7

PROCESS TIMES SUMMARY

ITEM	HISTOR. FLOW HOURS	SIMULATED FLOW HOURS	WAITING FOR RESOURCES HOURS	%	PROCESSING FLOW HOURS	%	BACKSHOP HOURS	%	NUMBER OF SAMPLES
AC	0.0	80.4	11.7	14.6%	68.7	85.4%	0.0	0.0%	184
AC/DB	0.0	173.4	85.4	49.2%	88.0	50.8%	0.0	0.0%	375
DB	0.0	36.9	12.3	33.3%	24.6	66.7%	0.0	0.0%	5
F-15QT	0.0	499.8	350.3	70.1%	149.5	29.9%	0.0	0.0%	102
F-15SQT	2508.0	68.0	16.4	24.1%	51.6	75.9%	0.0	0.0%	4
F-15ST	0.0	757.0	582.6	77.0%	174.4	23.0%	0.0	0.0%	341
F-16QT	0.0	465.3	313.2	67.3%	152.2	32.7%	0.0	0.0%	120
F-16SQT	2311.0	55.3	4.2	7.6%	51.1	92.4%	0.0	0.0%	4
F-16ST	0.0	790.1	604.1	76.5%	186.0	23.5%	0.0	0.0%	407
GG	0.0	76.7	24.3	31.7%	52.4	68.3%	0.0	0.0%	664

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 26-JUL-90 TIME: 12:57:36 REPT.ID: UFC 3rd PAGE: 8

RESOURCE QUEUE STATISTICS

RESOURCE QUEUE	AVERAGE QUEUE QUANTITY	STANDARD DEVIATION	MAXIMUM QUEUE QUANTITY	AVERAGE QUEUE WAIT (hrs)	CURRENT QUEUE QUANTITY	THE BLAKE STATISTIC
50002 EQ	0.18	4.51	178.00	0.06	8	0.01
50004 EQ	0.00	0.02	10.00	0.00	1	0.00
50005 EQ	0.00	0.00	2.00	0.00	1	0.00

080158

50173	ZQ	0.00	0.00	4.00	0.00	0	0.00
WG00	MP	3.58	4.05	23.00	1.99	6	7.11
WG09	MP	0.53	0.82	4.00	3.06	4	1.62
WG10	MP	5.63	5.09	22.00	1.92	4	10.80
WG11	MP	62.12	60.73	185.00	1.03	168	63.74
WGSW	MP	0.58	1.12	7.00	1.85	2	1.07

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 26-JUL-90 TIME: 12:57:36 REPT.ID: UFC 3rd PAGE: 9

ASSEMBLY STATISTICS

PARENT ITEM	TOTAL INDUCT	DELAYED OPERATIONS	WAIT (HOURS) AVERAGE	-----WAITING QUEUE COUNT-----		
				AVERAGE	STD.DEV.	MAXIMUM
AC/DB	746	187	80.7	1.7	1.3	6.0
F-15ST	404	442	110.7	5.6	2.7	14.0
F-16ST	455	598	111.9	7.7	4.2	18.0

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 26-JUL-90 TIME: 12:57:36 REPT.ID: UFC 3rd PAGE: 10

WORK IN PROCESS

ITEM	ALLOWABLE QUANTITY	AVERAGE	STD.DEV.	MINIMUM	MAXIMUM	CURRENT	AVERAGE		CURRENT	
							WAITING TIME	QUANTITY	WAITING TIME	QUANTITY
AC	99999	1.7	1.3	0	6	4	**	NONE	**	**
AC/DB	99999	7.5	3.6	1	17	9	**	NONE	**	**
DB	99999	0.0	0.1	0	1	0	**	NONE	**	**
F-15QT	99999	6.9	5.8	0	19	16	**	NONE	**	**
F-15SQT	99999	0.0	0.2	0	1	0	**	NONE	**	**
F-15ST	99999	37.1	27.5	6	87	85	**	NONE	**	**
F-16QT	99999	7.4	5.5	0	18	15	**	NONE	**	**
F-16SQT	99999	0.0	0.2	0	1	0	**	NONE	**	**
F-16ST	99999	42.9	28.1	2	93	78	**	NONE	**	**
GG	99999	5.8	3.1	0	15	6	**	NONE	**	**

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 26-JUL-90 TIME: 12:57:36 REPT.ID: UFC 3rd PAGE: 11

DEDICATED STOCK STATISTICS - Parallel Operations

STOCK ITEM	TOTAL INDUCT	DELAYED OPERATIONS	WAIT (HOURS) AVERAGE	-----WAITING QUEUE COUNT-----		
				AVERAGE	STD.DEV.	MAXIMUM

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 26-JUL-90 TIME: 12:57:36 REPT.ID: UFC 3rd PAGE: 12

DEDICATED STOCK STATISTICS - Subcomponents

STOCK ITEM	TOTAL INDUCT	DELAYED OPERATIONS	WAIT (HOURS) AVERAGE	WAITING QUEUE COUNT	
				AVERAGE STD.DEV.	MAXIMUM CURRENT
AC	376	373	0.0	0.0	1.0
AC/DB	746	744	0.0	0.0	1.0
DB	187	187	64.4	1.4	6.0
GG	743	744	0.0	0.0	1.0

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 26-JUL-90 TIME: 12:57:36 REPT.ID: UFC 3rd PAGE: 13

RESOURCE UTILIZATION by SHIFT

CODE	DESCRIPTION	SHIFT	NUMBER SHIFT AVAIL.	SHIFT UTIL.	AVERAGE NUMBER IN EACH STATE				OTHER DOWN	BATCHING		
					IDLE	IN USE	PREV. MAINT.	FAILURE		MIN SIZE	MAX SIZE	AVG SIZE
50002	50002	1	32.8	0.57	0.43	0.57	0.00	0.01	0.00			
		2	32.8	0.42	0.57	0.42	0.00	0.00	0.00			
		3	32.8	0.39	0.60	0.39	0.00	0.01	0.00			
		4	32.8	0.35	0.65	0.34	0.00	0.01	0.00			
		5	32.8	0.24	0.76	0.24	0.00	0.00	0.00			
		6	32.8	0.21	0.78	0.21	0.00	0.01	0.00			
50004	50004	1	9.8	0.32	0.68	0.32	0.00	0.01	0.00			
		2	9.8	0.20	0.79	0.20	0.00	0.01	0.00			
		3	9.8	0.12	0.88	0.12	0.00	0.01	0.00			
		4	9.8	0.26	0.73	0.26	0.00	0.00	0.00			
		5	9.8	0.19	0.81	0.19	0.00	0.00	0.00			
		6	9.8	0.11	0.89	0.10	0.00	0.01	0.00			
50005	50005	1	5.8	0.03	0.96	0.03	0.00	0.01	0.00			
		2	5.8	0.02	0.97	0.02	0.00	0.01	0.00			
		3	5.8	0.01	0.98	0.01	0.00	0.01	0.00			
		4	5.8	0.03	0.96	0.03	0.00	0.01	0.00			
		5	5.8	0.02	0.98	0.02	0.00	0.01	0.00			
		6	5.8	0.02	0.98	0.02	0.00	0.00	0.00			
50173	50173	1	16.8	0.03	0.97	0.03	0.00	0.00	0.00			
		2	16.8	0.03	0.97	0.03	0.00	0.00	0.00			
		3	16.8	0.02	0.98	0.02	0.00	0.00	0.00			

080160

WG00	WG00	4	16.8	0.00	1.00	0.00	0.00	0.00	0.00	0.00
		5	16.8	0.00	1.00	0.00	0.00	0.00	0.00	0.00
		6	16.8	0.00	1.00	0.00	0.00	0.00	0.00	0.00
		1	37.0	0.26	0.43	0.15	0.00	0.00	0.43	0.43
		2	10.0	0.56	0.25	0.32	0.00	0.00	0.43	0.43
		3	9.0	0.44	0.32	0.25	0.00	0.00	0.43	0.43
WG09	WG09	4	1.0	0.99	0.01	0.57	0.00	0.00	0.43	0.43
		5	1.0	1.00	0.00	0.57	0.00	0.00	0.43	0.43
		6	0.0	NO VALUES RECORDED						
		1	4.0	0.21	0.51	0.14	0.00	0.00	0.36	0.36
		2	2.5	0.29	0.46	0.18	0.00	0.00	0.36	0.36
		3	1.0	0.52	0.31	0.33	0.00	0.00	0.36	0.36

Note: Remember that the utilizations reflect only 80% of the workload and the other 20% may not be spread evenly across all resources.

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 26-JUL-90 TIME: 12:57:36 REPT.ID: UFC 3rd PAGE: 14

RESOURCE UTILIZATION BY SHIFT

CODE	DESCRIPTION	SHIFT	NUMBER SHIFT AVAIL.	SHIFT UTIL.	AVERAGE NUMBER IN EACH STATE				BATCHING		
					PREV.	IN USE	FAILURE	OTHER DOWN	MIN SIZE	MAX SIZE	AVG SIZE
WG10	WG10	1	8.8	0.76	0.20	0.65	0.00	0.15			
		2	4.5	0.90	0.09	0.76	0.00	0.15			
		3	2.0	0.98	0.02	0.83	0.00	0.15			
		4	6.0	0.84	0.13	0.72	0.00	0.15			
		5	4.0	0.87	0.11	0.74	0.00	0.15			
		6	2.0	0.92	0.07	0.78	0.00	0.15			
WG11	WG11	1	21.0	0.86	0.12	0.73	0.00	0.15			
		2	14.3	0.93	0.06	0.79	0.00	0.15			
		3	14.3	0.93	0.06	0.79	0.00	0.15			
		4	12.0	0.95	0.04	0.81	0.00	0.15			
		5	8.0	0.98	0.02	0.83	0.00	0.15			
		6	8.0	0.97	0.03	0.82	0.00	0.15			
WGSW	WGSW	1	2.0	0.34	0.38	0.20	0.00	0.43			
		2	1.0	0.30	0.40	0.17	0.00	0.43			
		3	1.0	0.10	0.52	0.06	0.00	0.43			

080161

4 0.0 NO VALUES RECORDED
5 0.0 NO VALUES RECORDED
6 0.0 NO VALUES RECORDED

Note: Remember that the utilizations reflect
only 80% of the workload and the other
20% may not be spread evenly across all
resources

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 26-JUL-90 TIME: 12:57:36 REPT.ID: UFC 3rd PAGE: 15

ITEM NAME: AC WCD NAME: SLOTHRU5

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL QTY	PROCESSED QTY	QUEUED QTY	QUEUED HRS	AVERAGE SCHEDULED HRS	AVERAGE SIMULATED HRS	DESC	RCC	OCC FAC
0100	187.	187.	15.	25.27	3.63	6.41	ASSY	MATPFA	1.00 WG00
0200	187.	187.	0.	0.00	7.41	16.16	REP	MATPFA	1.00
0300 S	187.	131.	52.	11.65	1.99	4.50	TEST	MATPFA	0.75 WG09, 50173
0400	187.	131.	20.	10.88	4.08	7.18	TEST	MATPFA	0.75 WG09, 50173
0500	188.	148.	34.	2.84	4.48	8.27	ASSY	MATPFA	0.75 WG00
0600 S	188.	188.	45.	11.37	1.99	3.54	TEST	MATPFA	1.00 WG09, 50173
0700	187.	187.	20.	9.33	8.95	17.70	TEST	MATPFA	1.00 WG09, 50173
0800	184.	20.	7.	1.62	7.57	12.90	REP	MATPFA	0.10 WG00
0900 S	184.	21.	6.	3.36	1.96	2.45	TEST	MATPFA	0.10 WG09, 50173
1000	184.	19.	4.	3.88	8.85	19.99	TEST	MATPFA	0.10 WG09, 50173
1100	184.	184.	41.	2.83	3.62	6.34	ASSY	MATPFA	1.00 WG00, as
ALC: SA	RCC: MATPFA	QUARTER: 4	DATE: 26-JUL-90	TIME: 12:57:36	REPT.ID: UFC 3rd	PAGE: 16			

ITEM NAME: AC/DB WCD NAME: SLOTHRU4

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL QTY	PROCESSED QTY	QUEUED QTY	QUEUED HRS	AVERAGE SCHEDULED HRS	AVERAGE SIMULATED HRS	DESC	RCC	OCC FAC
0100	377.	377.	95.	4.37	6.03	11.34	REP	MATPFA	1.00 WG00
0200	377.	377.	0.	0.00	3.70	7.41	DSSY	MATPFA	1.00
0300	376.	376.	184.	82.08	3.58	7.58	ASSY	MATPFA	1.00 WG00, as
0400 S	373.	340.	264.	36.46	3.57	4.70	TEST	MATPFA	0.90 WG10, 50002
ALC: SA	RCC: MATPFA	QUARTER: 4	DATE: 26-JUL-90	TIME: 12:57:36	REPT.ID: UFC 3rd	PAGE: 16			

0800162

OPER CODE	POTENTIAL QTY	PROCESSED QTY	QUEUED QTY	QUEUED HRS	AVERAGE SCHEDULED HRS	AVERAGE SIMULATED HRS	DESC	RCC	OCC	FAC
0500	374.	338.	129.	32.71	33.88	53.13	TEST	MATPFA	0.90	WG10, 50002
0600 S	377.	32.	17.	43.27	3.55	6.60	TEST	MATPFA	0.10	WG10, 50005
0700	377.	30.	8.	34.61	31.95	47.27	TEST	MATPFA	0.10	WG10, 50005
0800	376.	36.	19.	16.71	6.01	10.06	REP	MATPFA	0.10	WG00
0900 S	375.	39.	17.	41.41	3.55	4.60	TEST	MATPFA	0.09	WG10, 50002
1000	375.	26.	11.	25.42	32.31	47.96	TEST	MATPFA	0.09	WG10, 50002
1100 S	375.	1.	1.	19.96	3.72	3.72	TEST	MATPFA	0.01	WG10, 50005
1200	375.	3.	1.	74.74	35.77	64.02	TEST	MATPFA	0.01	WG10, 50005

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 26-JUL-90 TIME: 12:57:36 REPT.ID: UFC 3rd PAGE: 17

ITEM NAME: DB WCD NAME: SLOTHRU6

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL QTY	PROCESSED QTY	QUEUED QTY	QUEUED HRS	AVERAGE SCHEDULED HRS	AVERAGE SIMULATED HRS	DESC	RCC	OCC	FAC
0100	5.	5.	2.	28.33	4.36	6.40	REP	MATPFA	1.00	WG00
0200 S	5.	5.	0.	0.00	1.99	3.07	TEST	MATPFA	1.00	
0300	5.	5.	0.	0.00	9.73	13.69	TEST	MATPFA	1.00	
0400	5.	1.	0.	0.00	2.04	5.44	REP	MATPFA	0.05	
0500 S	5.	1.	1.	4.83	1.93	1.93	TEST	MATPFA	0.05	WG09, 50005
0600	5.	0.	0.	0.00	0.00	0.00	TEST	MATPFA	0.05	

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 26-JUL-90 TIME: 12:57:36 REPT.ID: UFC 3rd PAGE: 18

ITEM NAME: F-15QT WCD NAME: QUIKTHRU

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL QTY	PROCESSED QTY	QUEUED QTY	QUEUED HRS	AVERAGE SCHEDULED HRS	AVERAGE SIMULATED HRS	DESC	RCC	OCC	FAC
0000	116.	116.	0.	0.00	2.00	2.00	IN	MATPFA	1.00	
0100	116.	116.	116.	1.40	5.30	8.70	INSP	MATPFA	1.00	WG00
0200 S	116.	116.	93.	152.44	7.88	8.78	TEST	MATPFA	1.00	WG11, 50002
0300	114.	114.	36.	138.03	22.46	26.54	TEST	MATPFA	1.00	WG11, 50002
0400	110.	33.	8.	126.97	25.97	30.59	TEST	MATPFA	0.28	WG11, 50002
0500	108.	108.	54.	140.72	42.53	56.47	TEST	MATPFA	1.00	WG11, 50002
0600	108.	108.	44.	145.94	21.07	24.99	TEST	MATPFA	1.00	WG11, 50002
0700	106.	106.	51.	150.58	2.92	3.28	TEST	MATPFA	1.00	WG11, 50002
0800	102.	102.	54.	9.84	3.25	5.63	PACK	MATPFA	1.00	WGSW

0800163

9999 102. 102. 0. 0.00 4.00 4.00 OUT MATPFA 1.00
ALC: SA RCC: MATPFA QUARTER: 4 DATE: 26-JUL-90 TIME: 12:57:36 REPT.ID: UFC 3rd PAGE: 19

ITEM NAME: F-15SQT WCD NAME: SUPQTHRU

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL QTY	PROCESSED QTY	QUEUED QTY	QUEUED HRS	AVERAGE SCHEDULED HRS	AVERAGE SIMULATED HRS	DESC	RCC	OCC FAC
0000	4.	4.	0.	0.00	2.00	2.00	IN	MATPFA	1.00
0100	4.	4.	3.	2.47	5.30	6.20	INSP	MATPFA	1.00
0200 S	4.	4.	0.	0.00	8.62	10.12	TEST	MATPFA	1.00
0300	4.	4.	1.	6.21	20.48	22.88	TEST	MATPFA	1.00
0350	4.	4.	2.	2.29	2.58	2.88	TEST	MATPFA	1.00
0400	4.	4.	1.	47.48	2.65	3.50	PACK	MATPFA	1.00
9999	4.	4.	0.	0.00	4.00	4.00	OUT	MATPFA	1.00

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 26-JUL-90 TIME: 12:57:36 REPT.ID: UFC 3rd PAGE: 20

ITEM NAME: F-15ST WCD NAME: SLOTHRUI

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL QTY	PROCESSED QTY	QUEUED QTY	QUEUED HRS	AVERAGE SCHEDULED HRS	AVERAGE SIMULATED HRS	DESC	RCC	OCC FAC
0000	404.	404.	0.	0.00	2.00	2.00	IN	MATPFA	1.00
0100	404.	404.	404.	1.40	5.30	8.70	INSP	MATPFA	1.00

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 26-JUL-90 TIME: 12:57:36 REPT.ID: UFC 3rd PAGE: 21

ITEM NAME: F-15ST WCD NAME: SLOTHRU0

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL QTY	PROCESSED QTY	QUEUED QTY	QUEUED HRS	AVERAGE SCHEDULED HRS	AVERAGE SIMULATED HRS	DESC	RCC	OCC FAC
0000	404.	404.	0.	0.00	2.00	2.00	IN	MATPFA	1.00
0100	404.	404.	404.	1.40	5.30	8.70	INSP	MATPFA	1.00

OPER CODE	POTENTIAL QTY	PROCESSED QTY	QUEUED QTY	QUEUED HRS	152.52	7.96	8.83	TEST	MATPFA	1.00	WG11,50002
0100 S	292.	292.	232.	152.52	7.96	8.83	TEST	MATPFA	1.00	WG11,50002	
0200	278.	278.	106.	139.28	22.85	27.06	TEST	MATPFA	1.00	WG11,50002	
0300	275.	60.	29.	172.64	24.00	28.56	TEST	MATPFA	0.19	WG11,50002	
0400	275.	124.	56.	132.01	42.40	56.66	TEST	MATPFA	0.46	WG11,50002	
0500	273.	83.	41.	144.57	20.98	24.42	TEST	MATPFA	0.30	WG11,50002	

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 26-JUL-90 TIME: 12:57:36 REPT.ID: UFC 3rd PAGE: 22

ITEM NAME: F-15ST WCD NAME: SLOTHRU1

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL QTY	PROCESSED QTY	QUEUED QTY	QUEUED HRS	AVERAGE SCHEDULED HRS	AVERAGE SIMULATED HRS	DESC	RCC	OCC	FAC
0100	87.	87.	32.	8.63	2.10	2.62	REP	MATPFA	1.00	WG00
0200 S	87.	87.	69.	153.61	7.83	8.80	TEST	MATPFA	1.00	WG11,50002
0300	86.	61.	28.	174.09	42.32	56.78	TEST	MATPFA	0.75	WG11,50002

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 26-JUL-90 TIME: 12:57:36 REPT.ID: UFC 3rd PAGE: 23

ITEM NAME: F-15ST WCD NAME: SLOTHRU7

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL QTY	PROCESSED QTY	QUEUED QTY	QUEUED HRS	AVERAGE SCHEDULED HRS	AVERAGE SIMULATED HRS	DESC	RCC	OCC	FAC
0010	308.	308.	0.	0.00	0.00	0.00	DSSY	MATPFA	1.00	NR
0020	308.	308.	270.	72.94	0.00	0.00	ASSY	MATPFA	1.00	,as
0050	305.	305.	141.	12.90	4.48	6.90	DSSY	MATPFA	1.00	WG00,50002
0100	306.	306.	200.	155.51	4.15	6.83	ASSY	MATPFA	1.00	WG00,50002,as
0200 S	305.	305.	241.	151.31	13.49	15.28	TEST	MATPFA	1.00	WG11,50002
0300	295.	295.	110.	147.98	42.00	54.84	TEST	MATPFA	1.00	WG11,50002
0400	290.	290.	109.	147.23	21.43	25.16	TEST	MATPFA	1.00	WG11,50002

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 26-JUL-90 TIME: 12:57:36 REPT.ID: UFC 3rd PAGE: 24

ITEM NAME: F-15ST WCD NAME: SLOTHRU3

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL QTY	PROCESSED QTY	QUEUED QTY	QUEUED HRS	AVERAGE SCHEDULED HRS	AVERAGE SIMULATED HRS	DESC	RCC	OCC FAC
0100	356.	356.	281.	142.11	2.87	3.21	TEST	MATPFA	1.00 WG11,50002
0200	342.	342.	137.	10.29	3.27	5.19	PACK	MATPFA	1.00 WGSW
9999	341.	341.	0.	0.00	4.00	4.00	OUT	MATPFA	1.00

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 26-JUL-90 TIME: 12:57:36 REPT.ID: UFC 3rd PAGE: 25

ITEM NAME: F-16QT WCD NAME: QUIKTHRU

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL QTY	PROCESSED QTY	QUEUED QTY	QUEUED HRS	AVERAGE SCHEDULED HRS	AVERAGE SIMULATED HRS	DESC	RCC	OCC FAC
0000	129.	129.	0.	0.00	2.00	2.00	IN	MATPFA	1.00
0100	129.	129.	129.	1.40	5.30	8.70	INSP	MATPFA	1.00 WG00
0200 S	129.	129.	109.	128.08	7.66	8.50	TEST	MATPFA	1.00 WG11,50002
0300	125.	125.	58.	110.57	22.88	27.18	TEST	MATPFA	1.00 WG11,50002
0400	122.	40.	12.	171.75	24.46	29.02	TEST	MATPFA	0.28 WG11,50002
0500	122.	122.	56.	135.20	42.86	57.51	TEST	MATPFA	1.00 WG11,50002
0600	120.	120.	58.	122.64	21.38	25.03	TEST	MATPFA	1.00 WG11,50002
0700	119.	119.	56.	115.79	2.90	3.18	TEST	MATPFA	1.00 WG11,50002
0800	120.	120.	49.	11.73	3.37	6.61	PACK	MATPFA	1.00 WGSW
9999	120.	120.	0.	0.00	4.00	4.00	OUT	MATPFA	1.00

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 26-JUL-90 TIME: 12:57:36 REPT.ID: UFC 3rd PAGE: 26

ITEM NAME: F-16SQT WCD NAME: SUPQTHRU

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL QTY	PROCESSED QTY	QUEUED QTY	QUEUED HRS	AVERAGE SCHEDULED HRS	AVERAGE SIMULATED HRS	DESC	RCC	OCC FAC
0000	4.	4.	0.	0.00	2.00	2.00	IN	MATPFA	1.00
0100	4.	4.	3.	2.25	5.30	6.20	INSP	MATPFA	1.00 WG11
0200 S	4.	4.	0.	0.00	6.22	6.82	TEST	MATPFA	1.00
0300	4.	4.	2.	3.75	21.32	24.32	TEST	MATPFA	1.00 WG11,50002

0350 4. 4. 1. 0.02 2.65 3.25 TEST MATPFA 1.00 WGL1,50002
0400 4. 4. 2. 1.27 2.80 4.50 PACK MATPFA 1.00 WGSW
9999 4. 4. 0. 0.00 4.00 4.00 OUT MATPFA 1.00

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 26-JUL-90 TIME: 12:57:36 REPT.ID: UFC 3rd PAGE: 27

ITEM NAME: F-16ST WCD NAME: SLOTHRU1

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL PROCESSED		QUEUED		AVERAGE		DESC	RCC		OCC
	QTY	QTY	QTY	HRS	SCHEDULED HRS	SIMULATED HRS		QTY	FAC	
0000	455.	455.	0.	0.00	2.00	2.00	IN	MATPFA	1.00	WG00
0100	455.	455.	455.	1.40	5.30	8.71	INSP	MATPFA	1.00	

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 26-JUL-90 TIME: 12:57:36 REPT.ID: UFC 3rd PAGE: 28

ITEM NAME: F-16ST WCD NAME: SLOTHRU0

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL PROCESSED		QUEUED		AVERAGE		DESC	RCC		OCC
	QTY	QTY	QTY	HRS	SCHEDULED HRS	SIMULATED HRS		QTY	FAC	
0100 S	312.	312.	268.	140.03	7.74	8.62	TEST	MATPFA	1.00	WGL1,50002
0200	303.	303.	127.	129.09	22.81	26.93	TEST	MATPFA	1.00	WGL1,50002
0300	300.	58.	24.	101.01	24.20	28.76	TEST	MATPFA	0.19	WGL1,50002
0400	300.	138.	46.	138.06	43.72	58.43	TEST	MATPFA	0.46	WGL1,50002
0500	296.	89.	41.	154.77	21.25	25.12	TEST	MATPFA	0.30	WGL1,50002

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 26-JUL-90 TIME: 12:57:36 REPT.ID: UFC 3rd PAGE: 29

ITEM NAME: F-16ST WCD NAME: SLOTHRU7

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL PROCESSED		QUEUED		AVERAGE		DESC	RCC		OCC
	QTY	QTY	QTY	HRS	SCHEDULED HRS	SIMULATED HRS		QTY	FAC	

0800167

0010	435.	435.	0.	0.00	0.00	0.00	DSSY	MATPFA	1.00	NR
0020	435.	435.	394.	79.27	0.00	0.00	ASSY	MATPFA	1.00	,as
0050	439.	439.	209.	13.69	4.52	7.77	DSSY	MATPFA	1.00	WG00,50002
0100	440.	440.	255.	148.68	4.12	7.08	ASSY	MATPFA	1.00	WG00,50002,as
0200 S	442.	442.	374.	136.47	13.42	15.42	TEST	MATPFA	1.00	WG11,50002
0300	431.	431.	186.	115.45	43.08	57.47	TEST	MATPFA	1.00	WG11,50002
0400	420.	420.	201.	121.89	20.75	24.30	TEST	MATPFA	1.00	WG11,50002

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 26-JUL-90 TIME: 12:57:36 REPT.ID: UFC 3rd PAGE: 30

ITEM NAME: F-16ST WCD NAME: SLOTHRU3

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL QTY	PROCESSED QTY	QUEUED QTY	QUEUED HRS	AVERAGE SCHEDULED HRS	AVERAGE SIMULATED HRS	DESC	RCC	OCC
0100	420.	420.	363.	128.54	2.89	3.14	TEST	MATPFA	1.00
0200	405.	405.	155.	7.42	3.29	5.18	PACK	MATPFA	1.00
9999	407.	407.	0.	0.00	4.00	4.00	OUT	MATPFA	1.00

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 26-JUL-90 TIME: 12:57:36 REPT.ID: UFC 3rd PAGE: 31

ITEM NAME: GG WCD NAME: SLOTHRU2

WCD by OPERATION STATISTIC AVERAGES

OPER CODE	POTENTIAL QTY	PROCESSED QTY	QUEUED QTY	QUEUED HRS	AVERAGE SCHEDULED HRS	AVERAGE SIMULATED HRS	DESC	RCC	OCC
0100	743.	363.	147.	8.16	3.04	4.59	REP	MATPFA	0.50
0200 S	742.	353.	285.	22.09	8.88	11.37	TEST	MATPFA	0.50
0300	743.	367.	221.	26.43	40.90	64.40	TEST	MATPFA	0.50
0400	744.	76.	33.	16.09	3.17	4.82	REP	MATPFA	0.10
0500 S	743.	77.	44.	29.45	8.37	11.83	TEST	MATPFA	0.10
0550	745.	65.	27.	30.78	41.31	65.10	TEST	MATPFA	0.10

ALC: SA RCC: MATPFA QUARTER: 4 DATE: 26-JUL-90 TIME: 12:57:36 REPT.ID: UFC 3rd PAGE: 32

BACKSHOP DWELL TIMES BY BACKSHOP RCC

ITEM	RCC	AVERAGE HOURS
AC	*** NO BACKSHOP ACTIVITY *****	
AC/DB	*** NO BACKSHOP ACTIVITY *****	
DB	*** NO BACKSHOP ACTIVITY *****	
F-15QT	*** NO BACKSHOP ACTIVITY *****	
F-15SQT	*** NO BACKSHOP ACTIVITY *****	
F-15ST	*** NO BACKSHOP ACTIVITY *****	
F-16QT	*** NO BACKSHOP ACTIVITY *****	
F-16SQT	*** NO BACKSHOP ACTIVITY *****	
F-16ST	*** NO BACKSHOP ACTIVITY *****	
GG	*** NO BACKSHOP ACTIVITY *****	

ALC: SA RCC: MATPPA QUARTER: 4 DATE: 26-JUL-90 TIME: 12:57:36 REPT.ID: UFC 3rd PAGE: 33

HISTORICAL vs. SIMULATED COMPARISON

ITEM	HISTORICAL VALUES			SIMULATED VALUES			WORKLOAD WEIGHT	PERCENTAGE DIFFERENCE
	FLOWTIME HOURS	STANDARD DEVIATION	SAMPLE SIZE	FLOWTIME HOURS	STANDARD DEVIATION	SAMPLE SIZE		
AC	0.00	0.00	0	80.39	25.95	184	0.000	0.00
AC/DB	0.00	0.00	0	173.41	74.93	375	0.000	0.00
DB	0.00	0.00	0	36.93	18.96	5	0.000	0.00
F-15QT	0.00	0.00	0	499.78	417.01	102	0.000	0.00
F-15SQT	2508.00	3566.00	80	68.00	25.83	4	0.000	97.29
F-15ST	0.00	0.00	0	756.99	562.82	341	0.000	0.00
F-16QT	0.00	0.00	0	465.33	363.41	120	0.000	0.00
F-16SQT	2311.00	2606.00	67	55.30	15.57	4	0.000	97.61
F-16ST	0.00	0.00	0	790.12	513.14	407	0.000	0.00
GG	0.00	0.00	0	76.70	58.06	664	0.000	0.00

ITEM AC	EXCLUDED FROM VALIDATION TEST DUE TO INSUFFICIENT DATA
ITEM AC/DB	EXCLUDED FROM VALIDATION TEST DUE TO INSUFFICIENT DATA
ITEM DB	EXCLUDED FROM VALIDATION TEST DUE TO INSUFFICIENT DATA
ITEM F-15QT	EXCLUDED FROM VALIDATION TEST DUE TO INSUFFICIENT DATA
ITEM F-15ST	EXCLUDED FROM VALIDATION TEST DUE TO INSUFFICIENT DATA
ITEM F-16QT	EXCLUDED FROM VALIDATION TEST DUE TO INSUFFICIENT DATA
ITEM F-16ST	EXCLUDED FROM VALIDATION TEST DUE TO INSUFFICIENT DATA
ITEM GG	EXCLUDED FROM VALIDATION TEST DUE TO INSUFFICIENT DATA

AC	SLOTHRU5	4				0.50			1A
							S		B
AC/DB	SLOTHRU4	4				0.50			1A
							S		B
DB	SLOTHRU6	4				0.03			1A
							S		B
F-15QT	QUIKTHRU	4	23	23	39	31	1.00		1A
									B
F-15SQT	SUPQTHRU	4	1	1	1	1	1.00	367	1A
	2508.00 3566.00		80						B
F-15ST	SLOTHRU0	4	80	80	136	108	0.70		1A
									B
F-15ST	SLOTHRU1						0.20		
F-15ST	SLOTHRU3						1.00		
F-15ST	SLOTHRU7						0.80		
F-15ST	SLOTHRUI						1.00		
F-16QT	QUIKTHRU	4	41	17	40	31	1.00		1A
									B
F-16SQT	SUPQTHRU	4	1	1	1	1	1.00	367	1A
	2311.00 2606.00		67						B
F-16ST	SLOTHRU0	4	146	59	140	110	0.70		1A
									B
F-16ST	SLOTHRU3						1.00		
F-16ST	SLOTHRU7						1.00		
F-16ST	SLOTHRUI						1.00		
GG	SLOTHRU2	4					1.00		1A
							S		B

OD		QUIKTHRU0000 IN P	1.00	MATPFA
MF		C 2.00		
NR				
OD		QUIKTHRU0100 INSP P	1.00	MATPFA
MP	WG00	1C 5.30		
OD		QUIKTHRU0200 TEST S	1.00	MATPFA
MP	WG11	1T 2.00 6.00	12.00	
EQ	50002	1T 2.00 6.00	12.00	
OD		QUIKTHRU0300 TEST P	1.00	MATPFA
MP	WG11	1T 2.00 21.00	34.00	
EQ	50002	1T 2.00 21.00	34.00	
OD		QUIKTHRU0400 TEST P	0.28	MATPFA
MP	WG11	1T 6.00 22.00	36.00	
EQ	50002	1T 6.00 22.00	36.00	
OD		QUIKTHRU0500 TEST P	1.00	MATPFA
MP	WG11	1T 6.00 27.00	72.00	
EQ	50002	1T 6.00 27.00	72.00	
OD		QUIKTHRU0600 TEST P	1.00	MATPFA
MP	WG11	1T 2.00 14.00	36.00	
EQ	50002	1T 2.00 14.00	36.00	
OD		QUIKTHRU0700 TEST P	1.00	MATPFA
MP	WG11	1T 0.50 1.50	5.00	
EQ	50002	1T 0.50 1.50	5.00	
OD		QUIKTHRU0800 PACK P	1.00	MATPFA
MP	WGSW	1T 0.60 2.60	6.60	
OD		QUIKTHRU9999 OUT P	1.00	MATPFA
MF	NR	1C 4.00		
OD		SLOTHRU00100 TEST S	1.00	MATPFA
MP	WG11	1T 2.00 6.00	12.00	
EQ	50002	1T 2.00 6.00	12.00	
OD		SLOTHRU00200 TEST P	1.00	MATPFA
MP	WG11	1T 2.00 21.00	34.00	
EQ	50002	1T 2.00 21.00	34.00	
OD		SLOTHRU00300 TEST P	0.19	MATPFA
MP	WG11	1T 6.00 22.00	36.00	
EQ	50002	1T 6.00 22.00	36.00	
OD		SLOTHRU00400 TEST P	0.46	MATPFA
MP	WG11	1T 6.00 27.00	72.00	
EQ	50002	1T 6.00 27.00	72.00	
OD		SLOTHRU00500 TEST P	0.30	MATPFA
MP	WG11	1T 2.00 14.00	36.00	
EQ	50002	1T 2.00 14.00	36.00	
OD		SLOTHRU10100 REP P	1.00	MATPFA
MP	WG00	1T 1.50 2.00	2.90	
OD		SLOTHRU10200 TEST S	1.00	MATPFA
MP	WG11	1T 2.00 6.00	12.00	
EQ	50002	1T 2.00 6.00	12.00	
OD		SLOTHRU10300 TEST P	0.75	MATPFA
EQ	WG11	1T 6.00 27.00	72.00	
EQ	50002	1T 6.00 27.00	72.00	
OD		SLOTHRU20100 REP P	0.50	MATPFA
MP	WG00	1T 0.50 3.40	5.20	
OD		SLOTHRU20200 TEST S	0.50	MATPFA
MP	WG10	1T 2.00 3.00	16.00	
EQ	50004	1T 2.00 3.00	16.00	
OD		SLOTHRU20300 TEST P	0.50	MATPFA
MP	WG10	1T 6.00 24.00	70.00	
EQ	50004	1T 6.00 24.00	70.00	
OD		SLOTHRU20400 REP P	0.10	MATPFA
MP	WG00	1T 0.50 3.40	5.20	
OD		SLOTHRU20500 TEST S	0.10	MATPFA
MP	WG10	1T 2.00 3.00	16.00	
EQ	50004	1T 2.00 3.00	16.00	
OD		SLOTHRU20550 TEST P	0.10	MATPFA

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MP	WG10		1T	6.00	24.00	70.00	
EQ	50004		1T	6.00	24.00	70.00	
OD			SLOTHRU30100	TEST	P		1.00 MATPFA
MP	WG11		1T	0.50	1.50	5.00	
EQ	50002		1T	0.50	1.50	5.00	
OD			SLOTHRU30200	PACK	P		1.00 MATPFA
MP	WGSW		1T	0.60	2.60	6.60	
OD			SLOTHRU39999	OUT	P		1.00 MATPFA
MF			1C	4.00			
NR							
OD			SLOTHRU40100	REP	P		1.00 MATPFA
MP	WG00		1T	1.20	2.70	14.90	
OD			SLOTHRU40200	DSSY	P		1.00 MATPFA
MP	WG00		1T	2.00	3.10	6.00	
DS		AC		Y			
OD			SLOTHRU40300	ASSY	P		1.00 MATPFA
MP	WG00		1T	2.50	3.60	4.60	
AS		AC		Y			
OD			SLOTHRU40400	TEST	S		0.90 MATPFA
MP	WG10		1T	1.75	2.75	5.00	
EQ	50002		1T	1.75	2.75	5.00	
OD			SLOTHRU40500	TEST	P		0.90 MATPFA
MP	WG10		1T	2.00	26.00	56.00	
EQ	50002		1T	2.00	26.00	56.00	
OD			SLOTHRU40600	TEST	S		0.10 MATPFA
MP	WG10		1T	1.75	2.75	5.00	
EQ	50005		1T	1.75	2.75	5.00	
OD			SLOTHRU40700	TEST	P		0.10 MATPFA
MP	WG10		1T	2.00	26.00	56.00	
EQ	50005		1T	2.00	26.00	56.00	
OD			SLOTHRU40800	REP	P		0.10 MATPFA
MP	WG00		1T	1.20	2.70	14.90	
OD			SLOTHRU40900	TEST	S		0.09 MATPFA
MP	WG10		1T	1.75	2.75	5.00	
EQ	50002		1T	1.75	2.75	5.00	
OD			SLOTHRU41000	TEST	P		0.09 MATPFA
MP	WG10		1T	2.00	26.00	56.00	
EQ	50002		1T	2.00	26.00	56.00	
OD			SLOTHRU41100	TEST	S		0.01 MATPFA
MP	WG10		1T	1.75	2.75	5.00	
EQ	50005		1T	1.75	2.75	5.00	
OD			SLOTHRU41200	TEST	P		0.01 MATPFA
MP	WG10		1T	2.00	26.00	56.00	
EQ	50005		1T	2.00	26.00	56.00	
OD			SLOTHRU50100	ASSY	P		1.00 MATPFA
MP	WG00		1T	2.00	3.10	6.00	
DS		DB		Y			
OD			SLOTHRU50200	REP	P		1.00 MATPFA
MP	WG00		1T	1.10	5.30	14.90	
OD			SLOTHRU50300	TEST	S		0.75 MATPFA
MP	WG09		1T	0.75	2.00	2.50	
EQ	50173		1T	0.75	2.00	2.50	
OD			SLOTHRU50400	TEST	P		0.75 MATPFA
MP	WG09		1T	2.00	4.00	5.00	
EQ	50173		1T	2.00	4.00	5.00	
OD			SLOTHRU50500	ASSY	P		0.75 MATPFA
MP	WG00		1T	1.80	4.50	6.80	
OD			SLOTHRU50600	TEST	S		1.00 MATPFA
MP	WG09		1T	0.75	2.00	2.50	
EQ	50173		1T	0.75	2.00	2.50	
OD			SLOTHRU50700	TEST	P		1.00 MATPFA
MP	WG09		1T	4.00	8.00	12.00	
EQ	50173		1T	4.00	8.00	12.00	
OD			SLOTHRU50800	REP	P		0.10 MATPFA

MP	WG00	1T	1.10	5.30	14.90
OD		SLOTHRU50900 TEST S			0.10 MATPFA
MP	WG09	1T	0.75	2.00	2.50
EQ	50173	1T	0.75	2.00	2.50
OD		SLOTHRU51000 TEST P			0.10 MATPFA
MP	WG09	1T	4.00	8.00	12.00
EQ	50173	1T	4.00	8.00	12.00
OD		SLOTHRU51100 ASSY P			1.00 MATPFA
MP	WG00	1T	2.50	3.60	4.60
AS	DB	Y			
OD		SLOTHRU60100 REP P			1.00 MATPFA
MP	WG00	1T	1.30	3.20	10.10
OD		SLOTHRU60200 TEST S			1.00 MATPFA
MP	WG09	1T	0.75	2.00	2.50
EQ	50005	1T	0.75	2.00	2.50
OD		SLOTHRU60300 TEST P			1.00 MATPFA
MP	WG09	1T	2.00	4.50	16.00
EQ	50005	1T	2.00	4.50	16.00
OD		SLOTHRU60400 REP P			0.05 MATPFA
MP	WG00	1T	1.30	3.20	10.10
OD		SLOTHRU60500 TEST S			0.05 MATPFA
MP	WG09	1T	0.75	2.00	2.50
EQ	50005	1T	0.75	2.00	2.50
OD		SLOTHRU60600 TEST P			0.05 MATPFA
MP	WG09	1T	2.00	4.50	16.00
EQ	50005	1T	2.00	4.50	16.00
OD		SLOTHRU70010 DSSY P			1.00 MATPFA
NR					
DS	GG	Y			
OD		SLOTHRU70020 ASSY P			1.00 MATPFA
NR					
AS	GG	Y			
OD		SLOTHRU70050 DSSY P			1.00 MATPFA
MP	WG00	1T	2.00	2.50	7.00
EQ	50002	1T	2.00	2.50	7.00
DS	AC/DB	Y			
OD		SLOTHRU70100 ASSY P			1.00 MATPFA
MP	WG00	1T	1.00	3.60	6.00
EQ	50002	1T	1.00	3.60	6.00
AS	AC/DB	Y			
OD		SLOTHRU70200 TEST S			1.00 MATPFA
MP	WG11	1T	2.00	6.00	24.00
EQ	50002	1T	2.00	6.00	24.00
OD		SLOTHRU70300 TEST P			1.00 MATPFA
MP	WG11	1T	6.00	27.00	72.00
EQ	50002	1T	6.00	27.00	72.00
OD		SLOTHRU70400 TEST P			1.00 MATPFA
MP	WG11	1T	2.00	14.00	36.00
EQ	50002	1T	2.00	14.00	36.00
OD		SLOTHRU10000 IN P			1.00 MATPFA
MF	WG11	1C	2.00		
NR					
OD		SLOTHRU10100 INSP P			1.00 MATPFA
MP	WG00	1C	5.30		
OD		SUPQTHRU0000 IN P			1.00 MATPFA
MF		C	2.00		
NR					
OD		SUPQTHRU0100 INSP P			1.00 MATPFA
MP	WG11	1C	5.30		
OD		SUPQTHRU0200 TEST S			1.00 MATPFA
TP	WG11	1T	2.00	6.00	12.00
EQ	50002	1T	2.00	6.00	12.00
OD		SUPQTHRU0300 TEST P			1.00 MATPFA
MP	WG11	1T	2.00	14.00	36.00

EQ 50002
OD
MP WG11
EQ 50002
OD
MP WGSW
OD
MF WG11
NR

1T	2.00	14.00	36.00	
SUPQTHRU0350	TEST	P	1.00	MATPFA
1T	0.50	1.50	5.00	
1T	0.50	1.50	5.00	
SUPQTHRU0400	PACK	P	1.00	MATPFA
1T	0.60	2.60	6.60	
SUPQTHRU9999	OUT	P	1.00	MATPFA
1C	4.00			

THIS USAGE REPORT IS FOR RCC: *f~ ~
 THIS REPORT PROVIDES THE ESTIMATED USAGE FOR
 EACH RESOURCE BY PART.

RESOURCE NAME:50002 RESOURCE NOUN: 50002
 NO ALTERNATES FOUND FOR THIS RESOURCE

PART NAME	YEARLY INDUCTIONS	TOTAL HOURS NEEDED
F-15QT	116.	9394.07
F-15SQT	4.	95.67
F-15ST	404.	37090.03
F-16QT	129.	10446.85
F-16SQT	4.	95.67
F-16ST	455.	44697.84

TOTAL HOURS NEEDED TO PROCESS ALL PARTS:*****

TOTAL HOURS AVAILABLE: 286104.00

PROJECTED UTILIZATION FOR THIS RESOURCE: *****

RESOURCE NAME:50004 RESOURCE NOUN: 50004
 NO ALTERNATES FOUND FOR THIS RESOURCE

PART NAME	YEARLY INDUCTIONS	TOTAL HOURS NEEDED
GG	859.	17351.80

TOTAL HOURS NEEDED TO PROCESS ALL PARTS: 17351.80

TOTAL HOURS AVAILABLE: 85176.00

PROJECTED UTILIZATION FOR THIS RESOURCE: .20

RESOURCE NAME:50005 RESOURCE NOUN: 50005
 NO ALTERNATES FOUND FOR THIS RESOURCE

PART NAME	YEARLY INDUCTIONS	TOTAL HOURS NEEDED
AC/DB	859.	1415.38
DB	859.	213.09

TOTAL HOURS NEEDED TO PROCESS ALL PARTS: 1628.47

TOTAL HOURS AVAILABLE: 50232.00

PROJECTED UTILIZATION FOR THIS RESOURCE: .03

RESOURCE NAME:50173 RESOURCE NOUN: 50173
 NO ALTERNATES FOUND FOR THIS RESOURCE

PART NAME	YEARLY INDUCTIONS	TOTAL HOURS NEEDED
AC	859.	6504.24
TOTAL HOURS NEEDED TO PROCESS ALL PARTS:		6504.24
TOTAL HOURS AVAILABLE:		146328.00
PROJECTED UTILIZATION FOR THIS RESOURCE:		.04

RESOURCE NAME:WG00 RESOURCE NOUN: WG00
NO ALTERNATES FOUND FOR THIS RESOURCE

PART NAME	YEARLY INDUCTIONS	TOTAL HOURS NEEDED
AC	859.	7356.62
AC/DB	859.	5117.49
DB	859.	109.14
F-15QT	116.	614.80
F-15ST	404.	4484.40
F-16QT	129.	683.70
F-16ST	455.	5475.17
GG	859.	1657.87
TOTAL HOURS NEEDED TO PROCESS ALL PARTS:		25499.18
TOTAL HOURS AVAILABLE:		67932.81
PROJECTED UTILIZATION FOR THIS RESOURCE:		.38

RESOURCE NAME:WG09 RESOURCE NOUN: WG09
NO ALTERNATES FOUND FOR THIS RESOURCE

PART NAME	YEARLY INDUCTIONS	TOTAL HOURS NEEDED
AC	859.	6504.24
DB	859.	213.09
TOTAL HOURS NEEDED TO PROCESS ALL PARTS:		6717.33
TOTAL HOURS AVAILABLE:		10057.45
PROJECTED UTILIZATION FOR THIS RESOURCE:		.67

RESOURCE NAME:WG10 RESOURCE NOUN: WG10
NO ALTERNATES FOUND FOR THIS RESOURCE

PART NAME	YEARLY INDUCTIONS	TOTAL HOURS NEEDED
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AC/DB	859.	14153.81
GG	859.	17351.80

TOTAL HOURS NEEDED TO PROCESS ALL PARTS: 31505.61

TOTAL HOURS AVAILABLE: 35448.41

PROJECTED UTILIZATION FOR THIS RESOURCE: .89

 * 75% PROJECTED UTILIZATION REACHED *
 ** PLEASE INVESTIGATE **

RESOURCE NAME:WG11 RESOURCE NOUN: WG11
 NO ALTERNATES FOUND FOR THIS RESOURCE

PART NAME	YEARLY INDUCTIONS	TOTAL HOURS NEEDED
F-15QT	116.	9394.07
F-15SQT	4.	116.87
F-15ST	404.	34913.81
F-16QT	129.	10446.85
F-16SQT	4.	116.87
F-16ST	455.	41634.17

TOTAL HOURS NEEDED TO PROCESS ALL PARTS: 96622.63

TOTAL HOURS AVAILABLE: 107317.60

PROJECTED UTILIZATION FOR THIS RESOURCE: .90

 * 75% PROJECTED UTILIZATION REACHED *
 ** PLEASE INVESTIGATE **

RESOURCE NAME:WGSW RESOURCE NOUN: WGSW
 ALTERNATES FOR THIS RESOURCE

WG00

PART NAME	YEARLY INDUCTIONS	TOTAL HOURS NEEDED
F-15QT	116.	340.27
F-15SQT	4.	11.73
F-15ST	404.	1185.07
F-16QT	129.	378.40
F-16SQT	4.	11.73
F-16ST	455.	1334.67

TOTAL HOURS NEEDED TO PROCESS ALL PARTS: 3261.87

TOTAL HOURS AVAILABLE: 4784.00

PROJECTED UTILIZATION FOR THIS RESOURCE: .68

THIS USAGE REPORT IS FOR RCC: *E~ ~
 THIS REPORT PROVIDES THE REQUIREMENTS FOR
 EACH PART BY RESOURCE.

PART NAME:AC

AIRFRAME:

YEARLY INDUCTIONS: 131071.

RESOURCE NAME	TOTAL HOURS NEEDED
------------------	-----------------------

50173	992453.24
WG00	1122514.00
WG09	992453.24

TOTAL HOURS NEEDED TO PROCESS THIS PART: 3107420.20

PART NAME:AC/DB

AIRFRAME:

YEARLY INDUCTIONS: 8.081009E+08

RESOURCE NAME	TOTAL HOURS NEEDED
------------------	-----------------------

50002	*****
50005	*****
WG00	*****
WG10	*****

TOTAL HOURS NEEDED TO PROCESS THIS PART:*****

PART NAME:DB

AIRFRAME:

YEARLY INDUCTIONS: 131071.

RESOURCE NAME	TOTAL HOURS NEEDED
------------------	-----------------------

50005	32513.80
WG00	16652.57
WG09	32513.80

TOTAL HOURS NEEDED TO PROCESS THIS PART: 81680.16

PART NAME:F-15QT

AIRFRAME:

YEARLY INDUCTIONS: 116.000

RESOURCE NAME	TOTAL HOURS NEEDED
------------------	-----------------------

50002	9394.07
WG00	614.80
WG11	9394.07
WGSW	340.27

TOTAL HOURS NEEDED TO PROCESS THIS PART: 19743.20

PART NAME:F-15SQT

AIRFRAME:

YEARLY INDUCTIONS: 4.00000

RESOURCE
NAME

TOTAL
HOURS NEEDED

50002	95.67
WG11	116.87
WGSW	11.73

TOTAL HOURS NEEDED TO PROCESS THIS PART: 224.27

PART NAME:F-15ST

AIRFRAME:

YEARLY INDUCTIONS: 404.000

RESOURCE
NAME

TOTAL
HOURS NEEDED

50002	37090.03
WG00	4484.40
WG11	34913.81
WGSW	1185.07

TOTAL HOURS NEEDED TO PROCESS THIS PART: 77673.31

PART NAME:F-16QT

AIRFRAME:

YEARLY INDUCTIONS: 129.000

RESOURCE
NAME

TOTAL
HOURS NEEDED

50002	10446.85
WG00	683.70
WG11	10446.85
WGSW	378.40

TOTAL HOURS NEEDED TO PROCESS THIS PART: 21955.80

PART NAME:F-16SQT

AIRFRAME:

YEARLY INDUCTIONS: 4.00000

RESOURCE
NAME

TOTAL
HOURS NEEDED

50002	95.67
WG11	116.87
WGSW	11.73

TOTAL HOURS NEEDED TO PROCESS THIS PART: 224.27

PART NAME:F-16ST

AIRFRAME:

EARLY INDUCTIONS: 455.000

RESOURCE
NAME

TOTAL
HOURS NEEDED

50002	44697.84
WG00	5475.17
WG11	41634.17
WGSW	1334.67

TOTAL HOURS NEEDED TO PROCESS THIS PART: 93141.84

PART NAME:GG

AIRFRAME:

YEARLY INDUCTIONS: 859.000

RESOURCE NAME	TOTAL HOURS NEEDED

50004	17351.80
WG00	1657.87
WG10	17351.80

TOTAL HOURS NEEDED TO PROCESS THIS PART: 36361.47

ENGINEERING NOTES

EMPLOYEE P. Parker DATE 7/6/90 PAGE NO. 11
RCC MAFPFA SUBJECT Equipment Files Const.

7/6/90 - Friday

I called Susan Randolph this morning in regard to the resource data files she is working for us. Ms. Henderson was already with her, as she apparently needs much of the same information for other purposes. I asked that Ms. Henderson bring back any printouts which might be available. When Ms. Henderson arrived at our office, she told me that our initial concerns over the quality of the data was valid, and that Susan will need more time to clean up the database.

I feel that the data from this database (GO-11) will contain inherent accuracies due to input errors. I do not want to criticize this too much, however, as the data being collected should prove to be very valuable once all the "bugs" are worked out. This particular reporting format is only a year and a half old, and is probably not tracked as well as it will be in the future. The data being collected is fundamentally correct, and represents a significant step forward in tracking machine failures and availability, as well as the associated costs. In fact, many of the "in-house" reports I have seen being used since my arrival on this base should prove invaluable to DMMIS in the form of "feeder" reports. This is an important consideration for the IPI program, as we should be of use in identifying these areas of excellence in reporting, and aiding in distributing this information across division lines.

DATE RUN: 6/27/1990

MACHINE TOOL AND EQUIPMENT

EQUIPMENT DESCRIPTION

EQUIP IDENT : 04440 STOCK NO: 1-20-01-121-1022DQ
 NOMENCLATURE: TEST STAND UNIFIED COSERIAL S: AD500020003
 MANUFACTURE: HAMILTON STANDARD MODEL NO: PWA50002

MAINTENANCE COSTS AND REPAIRS:

REPAIR ORDER NUM	DATE IN	DATE COMPLETED	DOWN TIME	PROBLEM
89206-336	7/25/89	7/26/89	1.0	UPPER PLA PROBLEM
89207-308	7/26/89	7/26/89	1.0	NO PUMPS
89207-319	7/26/89	7/26/89	1.0	NO PFNA, NO PFT PRESSURE
89209-325	7/28/89	7/28/89	1.0	HYDRAULIC FLUID
89210-311	7/29/89	7/29/89	1.0	NO PUMPS
89211-301	7/30/89	7/30/89	1.0	NEEDS BURST DISC
89211-302	7/30/89	7/30/89	1.0	TEST HAS PUMP PROBLEMS
89212-305	7/31/89	7/31/89	1.0	BURST DISC
89212-324	7/31/89	7/31/89	2.0	PB WON'T GO TO 10
89213-313	8/ 1/89	8/ 1/89	1.0	PFT TEMP HIGH
89214-330	8/ 2/89	8/ 2/89	1.0	NO PUMPS
89214-333	8/ 2/89	8/ 3/89	3.0	NO PUMPS
89217-307	8/ 5/89	8/ 5/89	1.0	LACKS HYD FLUID
89219-328	8/ 7/89	8/ 7/89	0.6	FLUID NOT DRAINING
89220-326	8/ 8/89	8/ 8/89	1.0	BACK PRESSURE
89220-332	8/ 8/89	8/ 8/89	1.0	PLA WONT GO ABOVE 110
89221-300	8/ 9/89	8/ 9/89	0.5	BACK PRESSURE OUT LIMITS
89222-308	8/10/89	8/10/89	1.0	NO PUMP
89224-311	8/12/89	8/12/89	0.2	HYD FLUID
89226-322	8/14/89	8/14/89	1.0	PEE. MAKING TOO MUCH NOISE
89228-329	8/16/89	8/16/89	1.0	PFT REGULATOR
89232-308	8/20/89	8/20/89	0.5	BURST DISC INSIDE
89233-311	8/21/89	8/21/89	1.0	NO PUMPS
89234-337	8/22/89	8/22/89	0.1	COMP LOCKUP
89235-303	8/23/89	8/23/89	1.0	PFT REGULAR PROBLEM
89238-300	8/26/89	8/26/89	0.0	AIR NOZZLE
89239-306	8/27/89	8/27/89	5.0	SERVICE HYD OIL
89240-320	8/28/89	8/28/89	0.3	RP OIL
89240-326	8/28/89	8/28/89	0.1	PUMP SCHEDULER PROB
89242-321	8/30/89	8/30/89	1.0	NO PUMPS
89242-334	8/30/89	8/30/89	0.3	HYD FLUID
89243-304	8/31/89	8/31/89	1.2	NO PUMPS
89243-313	8/31/89	8/31/89	1.0	SMALL POODLE INSIDE T/S
89243-322	8/31/89	8/31/89	4.0	T/S LEAK
89254-304	9/11/89	9/11/89	0.5	NO PUMP
89256-334	9/13/89	9/13/89	1.0	HYD FLUID
89257-322	9/14/89	9/14/89	1.0	NO PUMPS

080134

HISTORICAL RECORD

ACQ DATE:	9/ 1/80	DATE INSTALLED :	6/ 1/81
ACQ COST:	210000	BUILDING NUMBER:	347
OWN ORGN:	MTPFA	LOCATION/COLUMN:	13-2

SKILL	REP MATERIAL RCC COST	LABOR COST	ACCUM COST
	10	79. 50	79. 50
	10	39. 75	119. 25
	10	39. 75	159. 00
	10	79. 50	238. 50
	10	39. 75	278. 25
	10	39. 75	318. 00
	10	39. 75	357. 75
	10	39. 75	397. 50
	10	79. 50	477. 00
	10	39. 75	516. 75
	10	39. 75	556. 50
	10	238. 50	795. 00
	10	39. 75	834. 75
	10	79. 50	914. 25
	10	39. 75	954. 00
	10	79. 50	1033. 50
	10	39. 75	1073. 25
	10	39. 75	1113. 00
	10	79. 50	1192. 50
	10	39. 75	1232. 25
	10	39. 75	1272. 00
	10	79. 50	1351. 50
	10	39. 75	1391. 25
	10	39. 75	1431. 00
	10	39. 75	1470. 75
	10	39. 75	1510. 50
	10	79. 50	1590. 00
	10	119. 25	1709. 25
	10	119. 25	1828. 50
	10	39. 75	1868. 25
	10	119. 25	1987. 50
	10	79. 50	2067. 00
	10	39. 75	2106. 75
	10	159. 00	2265. 75
	10	39. 75	2305. 50
	10	39. 75	2345. 25
	10	39. 75	2385. 00

ENGINEERING NOTES

EMPLOYEE ParkerDATE 7/8/80PAGE NO. 12RCC MAT PFASUBJECT Resource avo. '66-'74

7/09/90 - Monday

I have obtained a copy of the Actual Indirect Labor Factor report, A-GO37G-EH1-M1-8EH, which lists both the indirect + leave hours, and the the direct labor hours for the present fiscal year. (Note: The fourth quarter of this report is budgeted hours, not actual). This report should be useful for determining the manpower availability factor for use in the model resource files. The following calculations are applicable:

October '89 -

Total Direct hours charged = 18,134

*Estimated hours available = 24,320

*(based on 152 wage grade personnel available [out of 177 assigned, with maximum possible availability 160 hrs. per month per person, assuming straight eight hour day).

Oct. manpower availability factor: $18,134/24,320 \times 8 \text{ hrs.} = 5.97$

Similarly, for the following months, the availability factor is calculated as :

Nov. - 5.71

1st. qtr. FY '90 total = 5.47

Dec. - 4.72

Jan. - 6.36

Feb. - 4.75

2nd. qtr. FY '90 total = 5.40

Mar. - 5.08

Apr. - 4.64

May - 4.76

3rd. qtr. FY '90 total = 4.60

Jun. - 4.39

ENGINEERING NOTES

EMPLOYEE ParkerDATE 7/90/90PAGE NO. 13RCC MATATASUBJECT ~~MTT~~ Resource avail.

The 4th qtr. FY '90 estimated availability is 5.16 hours.

DDB SECTION CODE S.O

DDB PAGE NO. _____

080187

ENGINEERING NOTES

EMPLOYEE P. Barker DATE 7/13/90 PAGE NO. 14
RCC MATPFA SUBJECT Manpower profiles

7/13/90 - Friday

In order to obtain our first model run this afternoon, the following estimations are to be made:

1. The number of WG11 test personnel is to be set at 28 men per weekend overtime. These will distributed by shift as 12, eight, and eight respectively per Ms. Henderson's estimates. In order to adjust for the increased manpower availability that Ms. Henderson requested, the number of personnel available was reduced from 65 to 52-49 depending on the quarter involved.
2. The number of WG10 were adjusted in a similar manner. The overtime manpower and the manpower availability factors were adjusted per Ms. Henderson's request.
3. The WG09 personnel were also adjusted in the above manner.
4. The WG00 skill code represent all overhaul personnel. This is due to the joint decision that the model runs at this higher order would be relatively insensitive to these personnel. Given the information provided by both Ms. Henderson and production personnel, the critical path tasks are mainly located in the testing functions. The manpower availability factor is lower than reported actuals per Ms. Henderson's request for this model run.

Adjustments to the manpower availability were made in the following manner:

$$(5.47 \text{ hrs. available}) / (6.8 \text{ hrs desired}) = .80$$

and similarly,

ENGINEERING NOTES

EMPLOYEE _____ DATE _____ PAGE NO. _____
RCC _____ SUBJECT _____

$$5.40/6.8 = .79$$

$$4.60/6.8 = .68$$

$$5.16/6.8 = .76$$

In order to determine the number of personnel to be adjusted to, we perform the following:

$$27 \text{ WG11 personnel first shift} / 65 \text{ total all three shifts} = .42$$

and the number of personnel to be represented on first shift is

$$65 \text{ WG11 assigned} \times .80 \times .42 = 22 \text{ persons first shift}$$

The following attachments show the results of these calculations.

EMPLOYEE GARDNERDATE 30 July 90PAGE NO. 1RCC MATREASUBJECT Flow TIME

Met with ms [redacted], Mr. Sasa and Mr. Perez to discuss flowtime + validation in the model. I explained that, while we had historical flowtimes for WCCs, we didn't know if any of the time was nonproduction time, i.e. administrative delays, AWP time, or time spent awaiting support from other functions. I gave them the attached sheet to help illustrate what kind of information we were looking for. They agreed to try and provide the best data they could. I asked them to provide averages where possible (even estimated averages). Where they had existing databases with this ^{raw} data in it, I offered to do the number crunching and generate average figures.

If we can get this data, it will keep us from comparing "apples to oranges" during validation.

DDB SECTION CODE 2.0

DDB PAGE NO. _____

080190

8.1

EXPERIMENTATION

ENGINEERING NOTES

293

EMPLOYEE GARDNERDATE 27 Sept 90PAGE NO. 1RCC MATPFASUBJECT To 16 TAGUCHI ARRAY L16

EXP #

2

4

8

15

Shift
schedules
BASELINE# New
WG-105PLUMBING
BY WG-7 onlyAS/son
50005O/T
%

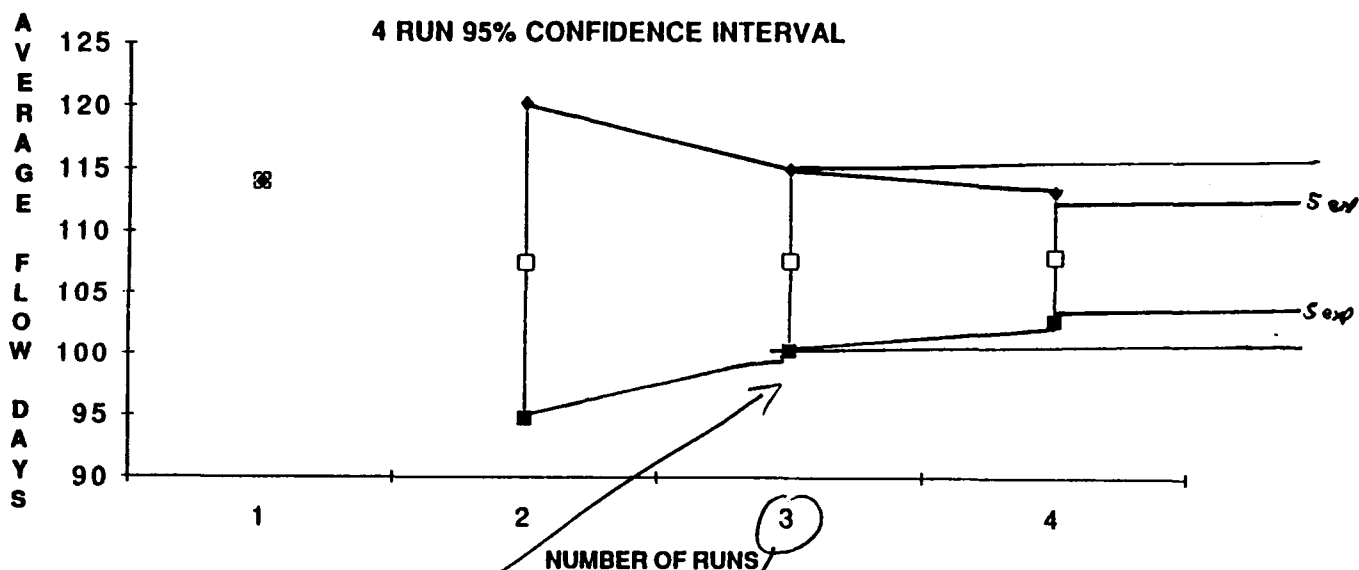
21

2	AS IS	Ø	AS IS	50005	2%
3	AS IS	Ø	WG-73	5/2	2%
4	AS IS	Ø	WG-73	5	AS IS
5	AS IS	+ 14	AS IS	5/2	2%
6	AS IS	+ 14	AS IS	5	AS IS
7	AS IS	+ 14	WG-7	5/2	AS IS
8	AS IS	+ 14	WG-7	5	2%
9	Balanced	Ø	AS IS	5/2	2%
10	Balanced	Ø	AS IS	5	AS IS
11	Balanced	Ø	WG-7	5/2	AS IS
12	Balanced	Ø	WG-7	5	2%
13	Balanced	+ 14	AS IS	5/2	AS IS
14	Balanced	+ 14	AS IS	5	2%
15	Balanced	+ 14	WG-7	5/2	2%
16	Balanced	+ 14	WG-7	5	AS IS

DDB SECTION CODE 4.0 8.1

DDB PAGE NO. _____

081001

EMPLOYEE GARDNERDATE 28 Sept 90PAGE NO. 1RCC MATFEASUBJECT Determination of # of Seed Runs

MDMSC is 95% confident that any deviation in mean average flowtime that occurs within these limits can be explained by the random deviation in the process & has no statistical significance

3 runs are sufficient.

ST Dev drops 2.7 between 2 runs & 3 but only 1.1 between 3 and 4.

Extrapolation indicates ~~by~~ less than a .5 drop between 4 runs and 5. Anything past 3 runs is diminishing returns.

ENGINEERING NOTES

194

EMPLOYEE GARDNER DATE 28 Sept 90 PAGE NO. 2
 RCC MATFEA SUBJECT SEED RUN DATA

UFC VALIDATION RUNS DETERMINATION OF THE NUMBER OF SEEDS TO RUN

		95% CONFIDENCE INTERVAL				
		LOWER LIMIT	MEAN	UPPER LIMIT		
AVERAGE FLOWDAYS	STDEV					
1 RUN	114.0					
2 RUNS	101.0	94.8	107.5	120.2	2 RUNS	
3 RUNS	108.0	100.3	107.7	115.0	3 RUNS	
4 RUNS	109.0	102.8	108.0	113.2	4 RUNS	

DDB SECTION CODE 2.08.1 DDB PAGE NO. _____

081003

EXPERIMENT WITHOUT AWP

S/N St Dev
29

RUN 1

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	88.35	37.99	158	474
AC/DB	130.51	85.76	473	928
DB	23.89	23.69	7	474
F-15QT	627.33	200.27	151	158
F-15SQT	330.88	11.65	2	2
F-15ST	2762.85	840.27	348	368
F16QT	633.69	192.09	230	238
F-16SQT	417	67.9	2	2
F-16ST	2918.35	942.11	533	552
GG	68.81	49.59	442	924

THREE RUN AVERAGE

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	86	38	139	455
AC/DB	125	82	456	923
DB	27	21	11	455
F-15QT	529	214	151	158
F-15SQT	295	92	2	2
F-15ST	2643	886	347	368
F-16QT	532	205	233	238
F-16SQT	272	119	2	2
F-16ST	2747	917	541	552
GG	67	48	464	919

RUN 2

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	82.38	35.2	128	443
AC/DB	124.25	85.19	448	927
DB	25.65	16.61	8	443
F-15QT	397.48	234.7	154	158
F-15SQT	257.63	185.76	3	2
F-15ST	2451.93	894.34	354	368
F-16QT	393.74	211.71	236	238
F-16SQT	286.79	290	2	2
F-16ST	2588.82	920.8	537	552
GG	64.83	44.84	477	919

THREE RUN STANDARD DEVIATION

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	3	3	17	17
AC/DB	5	6	15	7
DB	5	4	6	17
F-15QT	118	18	3	0
F-15SQT	37	88	1	0
F-15ST	167	42	8	0
F-16QT	124	11	3	0
F-16SQT	152	152	1	0
F-16ST	165	27	11	0
GG	2	3	19	6

RUN 3

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	86.02	40.37	131	447
AC/DB	120.52	75.84	446	915
DB	32.89	22.44	17	447
F-15QT	561.49	205.95	149	158
F-15SQT	297.32	78.33	2	2
F-15ST	2713.09	923.85	339	368
F-16QT	569.86	210.91	234	238
F-16SQT	113.04	0	1	2
F-16ST	2732.86	888.86	554	552
GG	66.63	50.81	472	913

		Average Flowdays	Monthly Prod
F-15	Run #1	88	42
	Run #2	76	43
	Run #3	85	41
	Average	83	42
	St Dev	6	1
F-16	Run #1	93	64
	Run #2	80	65
	Run #3	87	66
	Average	86	65
	St Dev	6	1
F-15 & F-16	Run #1	91	106
	Run #2	78	107
	Run #3	86	107
Average		85	106
St Dev		6	1

081004

MATPFA - CONFIRMATION RUNS**INDUCTIONS AT 110/MONTH**

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	89	38	152	456
AC/DB	108	64	453	902
DB	26	16	13	456
F-15QT	126	56	158	158
F-15SQT	63	26	2	2
F-15ST	3377	2394	345	368
F-16QT	133	58	240	238
F-16SQT	61	14	2	2
F-16ST	3493	2431	535	552
GG	54	36	437	905

AVERAGE FLOWDAYS 100

MONTHLY PRODUCTION 107

INDUCTIONS AT 120/MONTH

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	78	31	141	485
AC/DB	106	60	483	959
DB	27	21	22	485
F-15QT	135	56	173	172
F-15SQT	69	6	2	2
F-15ST	3371	2509	364	402
F-16QT	133	54	257	260
F-16SQT	30	6	2	2
F-16ST	3470	2502	570	602
GG	56	38	459	957

Average Flowdays 99

MONTHLY PRODUCTION 114

081005

INDUCTIONS AT 130/MONTH

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	88	37	169	539
AC/DB	111	65	545	1079
DB	26	14	12	539
F-15QT	163	86	181	186
F-15SQT	57	36	2	2
F-15ST	3730	2558	401	436
F-16QT	173	92	272	282
F-16SQT	52	6	2	2
F-16ST	3538	2436	611	652
GG	60	40	539	1082

Average Flowdays 106

MONTHLY PRODUCTION 122

INDUCTIONS AT 140/MONTH

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	87.04	34.84	182	557
AC/DB	120.28	65.48	561	1136
DB	27.87	14.16	16	557
F-15QT	305.1	246.45	186	200
F-15SQT	125.17	54.97	3	2
F-15ST	3689.44	2457.42	421	470
F-16QT	283.51	234.41	280	304
F-16SQT	250.49	247.05	2	2
F-16ST	3703.28	2413.9	621	702
GG	60.95	37.09	572	1136

Average Flowdays 110

MONTHLY PRODUCTION 126

081006

MATPFA L16 TAGUCHI ARRAY SETUP

factor -> EXP #	1 SHIFT SCHEDULES	2 NEW WG-10Ts	4 PLUMBING by WG00	8 ASIs on 50005	15 O/T PERCENTAGE
1	BASELINE AS IS	0	AS IS	5/2	AS IS
2	AS IS	0	AS IS	50005	2%
3	AS IS	0	WG-7s	5/2	2%
4	AS IS	0	WG-7s	50005	AS IS
5	AS IS	14	AS IS	5/2	2%
6	AS IS	14	AS IS	50005	AS IS
7	AS IS	14	WG-7	5/2	AS IS
8	AS IS	14	WG-7	50005	2%
9	BALANCED	0	AS IS	5/2	2%
10	BALANCED	0	AS IS	50005	AS IS
11	BALANCED	0	WG-7	5/2	AS IS
12	BALANCED	0	WG-7	50005	2%
13	BALANCED	14	AS IS	5/2	AS IS
14	BALANCED	14	AS IS	50005	2%
15	BALANCED	14	WG-7	5/2	2%
16	BALANCED	14	WG-7	50005	AS IS

081007

PRODUCTION

S/N RESPONSE TABLE

Factor:	SHIFT	WG10T	-	WG7	-
LEVEL 1	396.3	393	-	393.8	-
LEVEL 2	395.3	398.6	-	397.8	-
Factor:	-	-	ASI	-	-
LEVEL 1	-	-	395.9	-	-
LEVEL 2	-	-	395.7	-	-
Factor:	-	-	-	-	O/T
LEVEL 1	-	-	-	-	399.4
LEVEL 2	-	-	-	-	392.1

S/N RESPONSE TABLE (AVERAGES)

Factor:	SHIFT	WG10T	-	WG7	-
LEVEL 1	49.5	49.1	-	49.2	-
LEVEL 2	49.4	49.8	-	49.7	-
Factor:	-	-	ASI	-	-
LEVEL 1	-	-	49.5	-	-
LEVEL 2	-	-	49.5	-	-
Factor:	-	-	-	-	O/T
LEVEL 1	-	-	-	-	49.9
LEVEL 2	-	-	-	-	49

S/N MAIN EFFECTS ANALYSIS

MATPFA UDOS EXPERIMENTAL DESIGN

Quality Characteristic: ... the bigger the better ...

Significant Factors	Optimum Settings	Level #	Contribution
BALANCED WORK SHIFTS vs AS IS AS IS		1	49.5
ADDITION OF NEW WG-10T TRAINEES			
+14 WG10T		2	49.8
WG-7S DO ALL TEST STAND PLUMBING			
WG7S PLUMB		2	49.7
ALL ASIS PERFORMED ON 50005 STANDS			
AS IS		1	49.5
REDUCE OVERTIME TO 2%	AS IS	1	49.9

Total Contribution from significant factors = 248.4

Average Total for all results = 49.5

Estimate of average result (optimum) = 50.5

081008

PRODUCTION

DESCRIPTION OF EXPERIMENT

Title of Experiment:

MATPFA UDOS EXPERIMENTAL DESIGN

Goal/Objective:

REDUCE FLOWTIME AND/OR INCREASE OUTPUT OF UFCS

Comment:

CONDUCTED BY MDMSC IN ACCORDANCE WITH THE TO 16 SOW AND TOP

Standard Orthogonal Array Model Used: L16-2-15

Col.	Label	Description of factor	Level 1	Level 2	Level 3	Level 4
1	SHIFT	BALANCED WORK SHIFTS vs AS IS	AS IS	BALANCED		
2	WG10T	ADDITION OF NEW WG-10T TRAINEES	AS IS	+14 WG10T		
3						
4	WG7	WG-7S DO ALL TEST STAND PLUMBING	AS IS	WG7S PLUMB		
5						
6						
7						
8	ASI	ALL ASIS PERFORMED ON 50005 STANDS	AS IS	50005 ONLY		
9						
10						
11						
12						
13						
14						
15	O/T	REDUCE OVERTIME TO 2%	AS IS	2% OT		

EXPERIMENT RESULTS

[3 Trial(s) per Experiment]

	Trial # 1	Trial # 2	Trial # 3
Experiment # 1 :	101	104	104
Experiment # 2 :	84	82	88
Experiment # 3 :	91	97	97
Experiment # 4 :	105	104	108
Experiment # 5 :	106	96	98
Experiment # 6 :	106	108	103
Experiment # 7 :	103	106	109
Experiment # 8 :	102	99	102
Experiment # 9 :	80	77	80
Experiment # 10 :	100	99	98
Experiment # 11 :	103	106	106
Experiment # 12 :	97	95	91

081069

PROBATION

Experiment # 13 : 105 107 105

Experiment # 14 : 98 96 98

Experiment # 15 : 106 104 103

Experiment # 16 : 106 106 108

081010

PK. DUCTION

ANALYSIS OF VARIATION

Factor	Df	Sums of Squares	Variance	F-Ratio	Pure Sum of Sqs.	P(%)	
SHIFT	1	17.5	17.5	.93	0	0	%
WG10T	1	697.7	697.7	36.88	678.8	21.9	%
WG7	1	357.5	357.5	18.9	338.6	10.92	%
ASI	1	2.5	2.5	.13	0	0	%
O/T	1	1230.2	1230.2	65.03	1211.3	39.07	%
e	42	794.5	18.9		871.3	28.11	%
Total	47	3100				100.00	%

[Note: Insignificant factors are pooled and indicated by parenthesis.]

MATPFA UDOS EXPERIMENTAL DESIGN

Number of experiments = 48

Sum (experiment values) = 4777

Correction Factor = 475411

Sum of sqs (experiment values) = 3100

081011

PRODUCTION

RESPONSE TABLE

Factor:	SHIFT	WG10T	-	WG7	-
LEVEL 1	2403	2297	-	2323	-
LEVEL 2	2374	2480	-	2454	-
Factor:	-	-	ASI	-	-
LEVEL 1	-	-	2394	-	-
LEVEL 2	-	-	2383	-	-
Factor:	-	-	-	-	O/T
LEVEL 1	-	-	-	-	2510
LEVEL 2	-	-	-	-	2267

RESPONSE TABLE (AVERAGES)

Factor:	SHIFT	WG10T	-	WG7	-
LEVEL 1	100.1	95.7	-	96.8	-
LEVEL 2	98.9	103.3	-	102.3	-
Factor:	-	-	ASI	-	-
LEVEL 1	-	-	99.8	-	-
LEVEL 2	-	-	99.3	-	-
Factor:	-	-	-	-	O/T
LEVEL 1	-	-	-	-	104.6
LEVEL 2	-	-	-	-	94.5

MAIN EFFECTS ANALYSIS

MATPFA UDOS EXPERIMENTAL DESIGN

Quality Characteristic: ... the bigger the better ...

Significant Factors	Optimum Settings	Level #	Contribution
BALANCED WORK SHIFTS vs AS IS AS IS		1	100.1
ADDITION OF NEW WG-10T TRAINEES	+14 WG10T	2	103.3
WG-7S DO ALL TEST STAND PLUMBING	WG-7S DO ALL TEST STAND PLUMBING	0	0
ALL ASIS PERFORMED ON 50005 STANDS	ALL ASIS PERFORMED ON 50005 STANDS	0	0
REDUCE OVERTIME TO 2%	REDUCE OVERTIME TO 2%	0	0
Total Contribution from significant factors =			203.4
Average Total for all results =			99.5
Estimate of average result (optimum) =			-194.7

081012

PRODUCTION

S/N RATIO TABLE

Experiment	S/N Ratio (db)
1	49.8
2	48.1
3	49.1
4	50
5	49.6
6	50
7	50.1
8	49.6
9	47.5
10	49.5
11	50
12	49
13	50
14	49.3
15	49.9
16	50.1

MATPFA UDOS EXPERIMENTAL DESIGN

Bigger is Better

081013

PRODUCTION

S/N ANALYSIS OF VARIATION

Factor	Df	Sums of Squares	Variance	F-Ratio	Pure Sum of Sqs.	P(%)	
SHIFT	1	.1	.1	.31	0	0	%
WG10T	1	2	2	10.12	1.8	21.27	%
WG7	1	1	1	5.31	.8	10.05	%
ASI	1	.003	.003	.02	0	0	%
O/T	1	3.3	3.3	17.12	3.1	37.61	%
e	10	1.9	.2		2.6	31.07	%
Total	15	8.4				100.00	%

[Note: Insignificant factors are pooled and indicated by parenthesis.]

MATPFA UDOS EXPERIMENTAL DESIGN

Number of experiments = 16

Sum (experiment values) = 791.6

Correction Factor = 39162.4

Sum of sqs (experiment values) = 8.4

081014

Flow Time

DESCRIPTION OF EXPERIMENT

Title of Experiment:

MATPFA UDOS EXPERIMENTAL DESIGN

Goal/Objective:

REDUCE FLOWTIME AND/OR INCREASE OUTPUT OF UFCS

Comment:

CONDUCTED BY MDMSO IN ACCORDANCE WITH THE TO 16 SOW AND TOP

Standard Orthogonal Array Model Used: L16-2-15

Col.	Label	Description of factor	Level 1	Level 2	Level 3	Level 4
1	SHIFT	BALANCED WORK SHIFTS vs AS IS	AS IS	BALANCED		
2	WG10T	ADDITION OF NEW WG-10T TRAINEES	AS IS	+14 WG10T		
3						
4	WG7	WG-7S DO ALL TEST STAND PLUMBING	AS IS	WG7S PLUMB		
5						
6						
7						
8	ASI	ALL ASIS PERFORMED ON 50005 STANDS	AS IS	50005 ONLY		
9						
10						
11						
12						
13						
14						
15	O/T	REDUCE OVERTIME TO 2%	AS IS	2% OT		

EXPERIMENT RESULTS

[3 Trial(s) per Experiment]

	Trial # 1	Trial # 2	Trial # 3
Experiment # 1 :	114	101	108
Experiment # 2 :	133	139	145
Experiment # 3 :	126	117	115
Experiment # 4 :	103	103	102
Experiment # 5 :	105	113	112
Experiment # 6 :	103	101	103
Experiment # 7 :	104	101	106
Experiment # 8 :	106	108	109
Experiment # 9 :	150	135	143
Experiment # 10 :	116	110	108
Experiment # 11 :	99	104	102
Experiment # 12 :	112	115	119

081015

Flow Time

Experiment # 13 : 106	102	99
Experiment # 14 : 110	110	113
Experiment # 15 : 111	104	108
Experiment # 16 : 103	98	100

081016

FlowTime

ANALYSIS OF VARIATION

Factor	Df	Sums of Squares	Variance	F-Ratio	Pure Sum of Sqs.	P(%)	
SHIFT	1	0	0	0	0	0	%
WG10T	1	1680.3	1680.3	29.51	1623.4	21.15	%
WG7	1	867	867	15.23	810.1	10.56	%
ASI	1	5.3	5.3	.09	0	0	%
O/T	1	2730.1	2730.1	47.95	2673.2	34.83	%
e	42	2391.2	56.9		2567.3	33.45	%
Total	47	7673.9				100.00	%

[Note: Insignificant factors are pooled and indicated by parenthesis.]

MATPFA UDOS EXPERIMENTAL DESIGN

Number of experiments = 48

Sum (experiment values) = 5354

Correction Factor = 597194.1

Sum of sqs (experiment values) = 7673.9

081017

FLOW TIME

RESPONSE TABLE

Factor:	SHIFT	WG10T	-	WG7	-
LEVEL 1	2677	2819	-	2779	-
LEVEL 2	2677	2535	-	2575	-
Factor:	-	-	ASI	-	-
LEVEL 1	-	-	2685	-	-
LEVEL 2	-	-	2669	-	-
Factor:	-	-	-	-	O/T
LEVEL 1	-	-	-	-	2496
LEVEL 2	-	-	-	-	2858

RESPONSE TABLE (AVERAGES)

Factor:	SHIFT	WG10T	-	WG7	-
LEVEL 1	111.5	117.5	-	115.8	-
LEVEL 2	111.5	105.6	-	107.3	-
Factor:	-	-	ASI	-	-
LEVEL 1	-	-	111.9	-	-
LEVEL 2	-	-	111.2	-	-
Factor:	-	-	-	-	O/T
LEVEL 1	-	-	-	-	104
LEVEL 2	-	-	-	-	119.1

MAIN EFFECTS ANALYSIS

MATPFA UDOS EXPERIMENTAL DESIGN

Quality Characteristic: ... the smaller the better ...

Significant Factors	Optimum Settings	Level #	Contribution
BALANCED WORK SHIFTS vs AS ISBALANCED		2	111.5
ADDITION OF NEW WG-10T TRAINEES			
+14 WG10T		2	105.6
WG-7S DO ALL TEST STAND PLUMBING			
WG7S PLUMB		2	0
ALL ASIS PERFORMED ON 50005 STANDS			
50005 ONLY		2	0
REDUCE OVERTIME TO 2%	AS IS	1	0
Total Contribution from significant factors =			217.1
Average Total for all results =			111.5
Estimate of average result (optimum) =			-229.1

081018

FlowTime

S/N RATIO TABLE

Experiment	S/N Ratio (db)
1	-40.7
2	-42.9
3	-41.5
4	-40.2
5	-40.8
6	-40.2
7	-40.3
8	-40.6
9	-43.1
10	-40.9
11	-40.1
12	-41.2
13	-40.2
14	-40.9
15	-40.6
16	-40

MATPFA UDOS EXPERIMENTAL DESIGN

Smaller is Better

081019

FLOW TIME

S/N ANALYSIS OF VARIATION

Factor	Df	Sums of Squares	Variance	F-Ratio	Pure Sum of Sqs.	P(%)	
SHIFT	1	0	0	0	0	0	%
WG10T	1	3	3	10.5	2.7	21.73	%
WG7	1	1.5	1.5	5.26	1.2	9.73	%
ASI	1	.009	.009	.03	0	0	%
O/T	1	5.1	5.1	17.94	4.8	38.74	%
e	10	2.9	.3		3.7	29.8	%
Total	15	12.5				100.00	%

[Note: Insignificant factors are pooled and indicated by parenthesis.]

MATPFA UDOS EXPERIMENTAL DESIGN

Number of experiments = 16

Sum (experiment values) = -654.5

Correction Factor = 26771.8

Sum of sqs (experiment values) = 12.5

081010

Flow Time

S/N RESPONSE TABLE

Factor:	SHIFT	WG10T	-	WG7	-
LEVEL 1	-327.3	-330.7	-	-329.7	-
LEVEL 2	-327.2	-323.8	-	-324.8	-
Factor:	-	-	ASI	-	-
LEVEL 1	-	-	-327.4	-	-
LEVEL 2	-	-	-327.1	-	-
Factor:	-	-	-	-	O/T
LEVEL 1	-	-	-	-	-322.7
LEVEL 2	-	-	-	-	-331.8

S/N RESPONSE TABLE (AVERAGES)

Factor:	SHIFT	WG10T	-	WG7	-
LEVEL 1	-40.9	-41.3	-	-41.2	-
LEVEL 2	-40.9	-40.5	-	-40.6	-
Factor:	-	-	ASI	-	-
LEVEL 1	-	-	-40.9	-	-
LEVEL 2	-	-	-40.9	-	-
Factor:	-	-	-	-	O/T
LEVEL 1	-	-	-	-	-40.3
LEVEL 2	-	-	-	-	-41.5

S/N MAIN EFFECTS ANALYSIS

MATPFA UDOS EXPERIMENTAL DESIGN

Quality Characteristic: ... the smaller the better ...

Significant Factors	Optimum Settings	Level #	Contribution
BALANCED WORK SHIFTS vs AS IS BALANCED ADDITION OF NEW WG-10T TRAINEES		2	-40.9
+14 WG10T		2	-40.5
WG-7S DO ALL TEST STAND PLUMBING			
WG7S PLUMB		2	-40.6
ALL ASIS PERFORMED ON 50005 STANDS			
50005 ONLY		2	-40.9
REDUCE OVERTIME TO 2%	AS IS	1	-40.3

Total Contribution from significant factors = -203.2

Average Total for all results = -40.9

Estimate of average result (optimum) = -39.6

081001

MATPFA L16 TAGUCHI ARRAY RESULTS

THREE RUN AVERAGES AND STANDARD DEVIATIONS

Experiment #	Flowdays		S/N St Dev	Monthly Production	
	Average	St Dev		Average	St Dev
1	108	7	71	103	2
2	139	6	75	85	3
3	119	6	74	95	3
4	103	1	71	105	2
5	110	4	71	100	5
6	102	1	69	106	2
7	104	3	71	106	3
8	108	2	70	101	1
9	143	7	73	79	2
10	111	4	73	99	1
11	102	2	71	105	2
12	115	3	72	94	3
13	103	4	71	106	1
14	111	2	72	98	1
15	108	3	71	104	2
16	100	3	70	107	1

	FLOWDAYS		S/N	PRODUCTION	
	AVERAGE	ST DEV	St Dev	AVERAGE	ST DEV
FACTOR 1					
LEVEL 1	112	12	72	100	7
LEVEL 2	112	14	72	99	9
FACTOR 2					
LEVEL 1	118	16	73	96	10
LEVEL 2	106	4	71	104	3
FACTOR 4					
LEVEL 1	116	16	72	97	10
LEVEL 2	107	7	71	102	5
FACTOR 8					
LEVEL 1	112	14	72	100	9
LEVEL 2	111	12	72	99	7
FACTOR 15					
LEVEL 1	104	4	71	105	3
LEVEL 2	119	14	72	95	9

081022

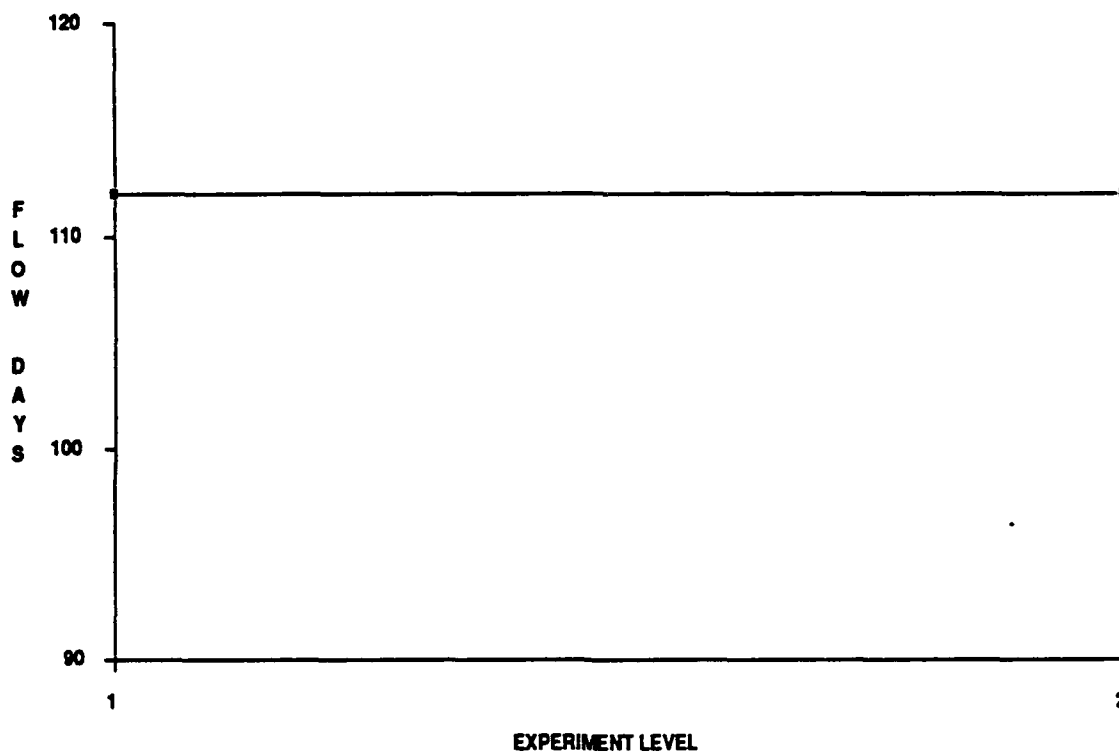
ENGINEERING NOTES

EMPLOYEE GARDNER DATE 6 Oct 90 PAGE NO. _____
RCC MATPFA SUBJECT MAIN EFFECTS CHARTS

The following charts illustrate the main effects produced by changes in the levels of each factor modeled in the L(16) Taguchi orthogonal array. They should show the effect on Flowtime and production throughput caused by each change.

DDB SECTION CODE 8.1 DDB PAGE NO. _____

081033

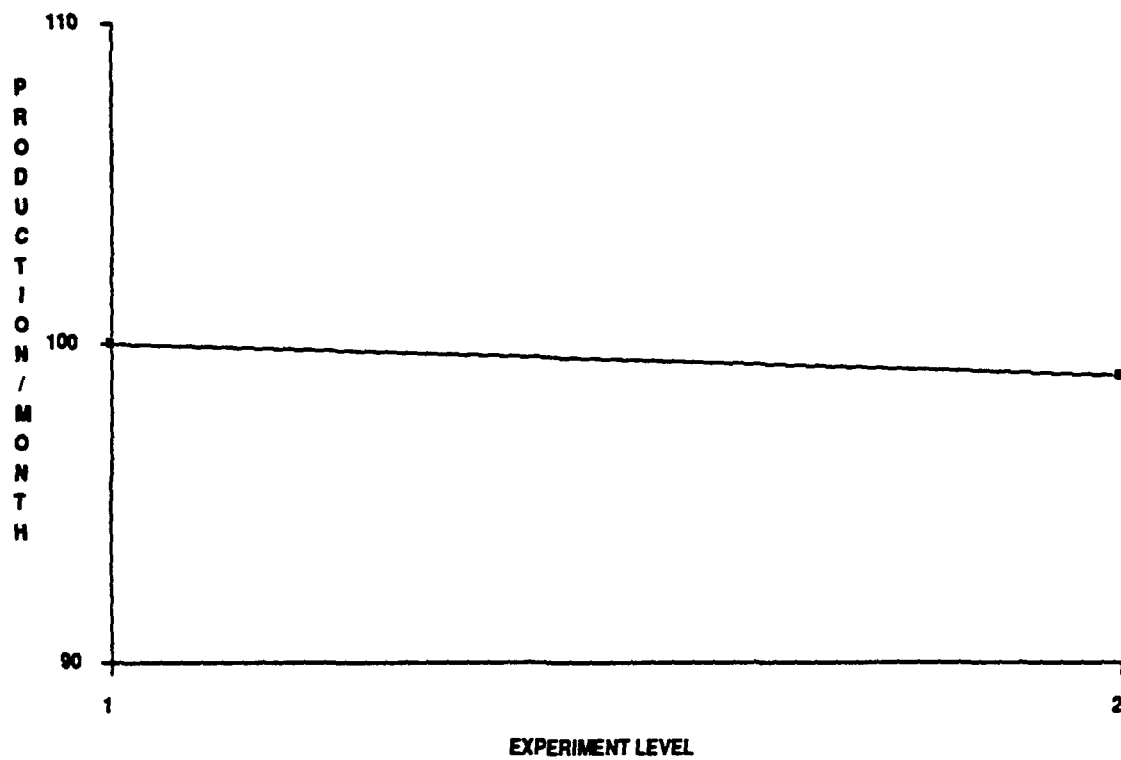


MINOR EFFECT

20809

FACTOR 1 - BALANCED SHIFTS
FIGURE 8.2.1.3-1

081034



MINOR EFFECT

20810

FACTOR 1 - BALANCED SHIFTS
FIGURE 8.2.1.3-2

081015

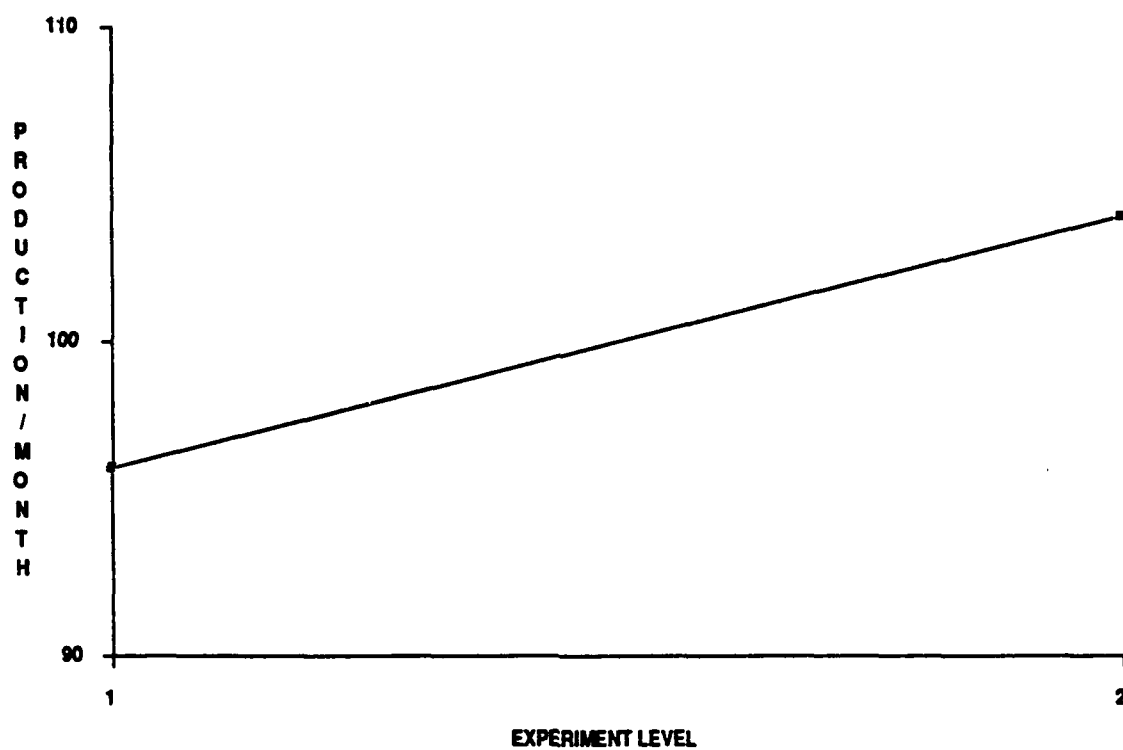


SIGNIFICANT EFFECT

20811

FACTOR 2 - ADDING WG-10Ts
FIGURE 8.2.1.3-3

081026

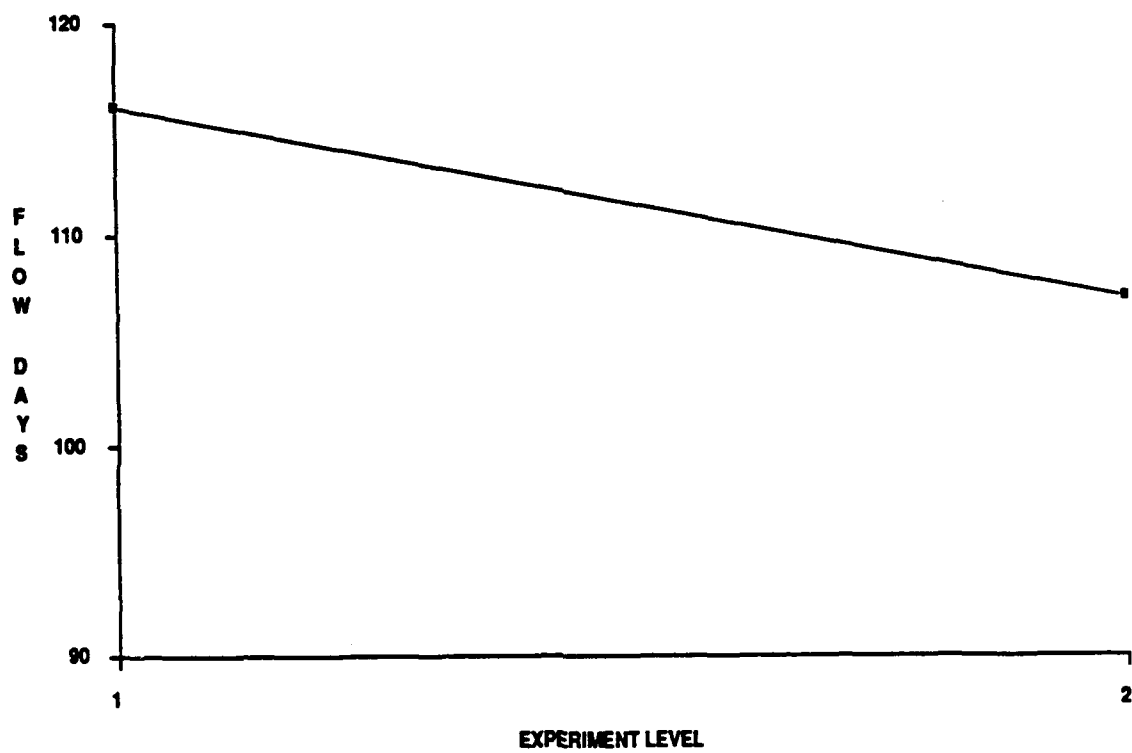


SIGNIFICANT EFFECT

20812

FACTOR 2 - ADDING WG-10Ts
FIGURE 8.2.1.3-4

081027



SIGNIFICANT EFFECT

20813

FACTOR 4 - WG-7s PLUMB
FIGURE 8.2.1.3-5

081028

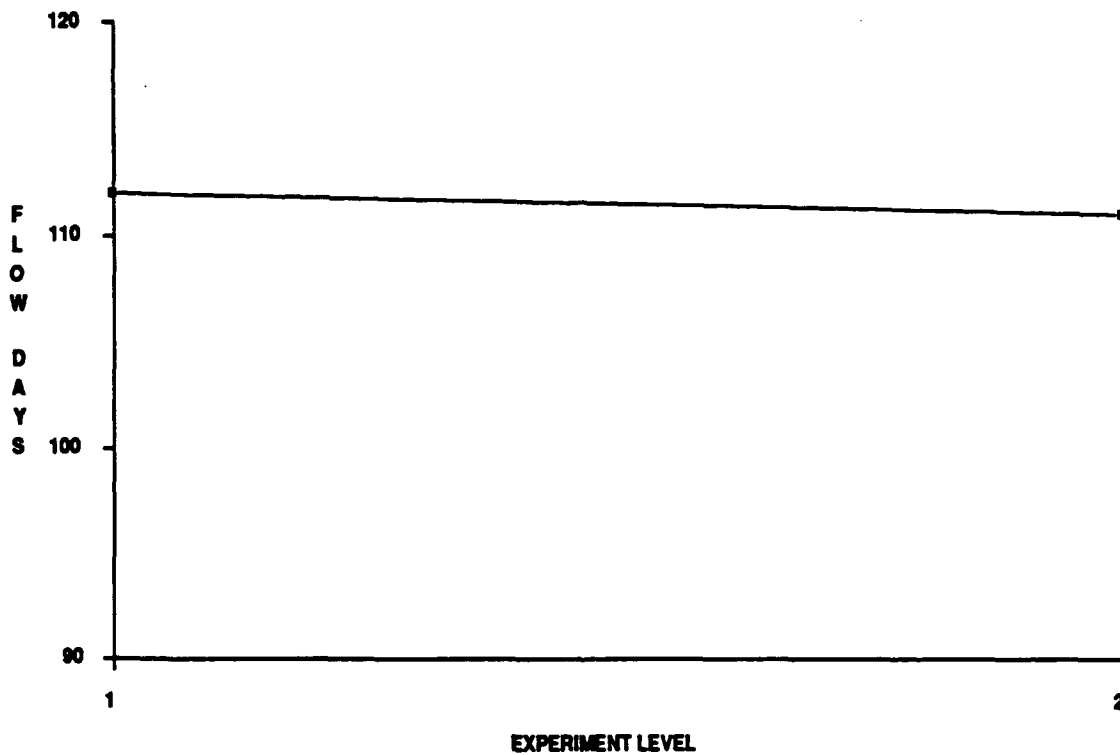


SIGNIFICANT EFFECT

20814

FACTOR 4 - WG-7s PLUMB
FIGURE 8.2.1.3-6

081029

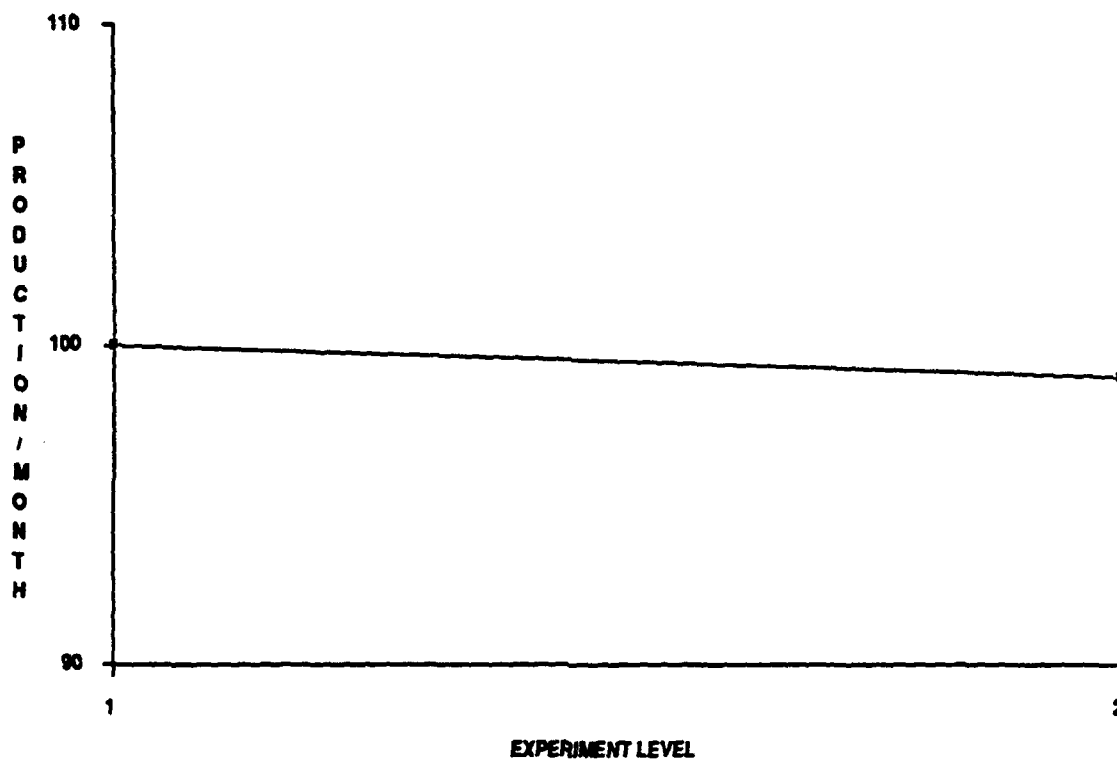


MINOR EFFECT

20815

FACTOR 8 - AS IS ON 50005s ONLY
FIGURE 8.2.1.3-7

081050

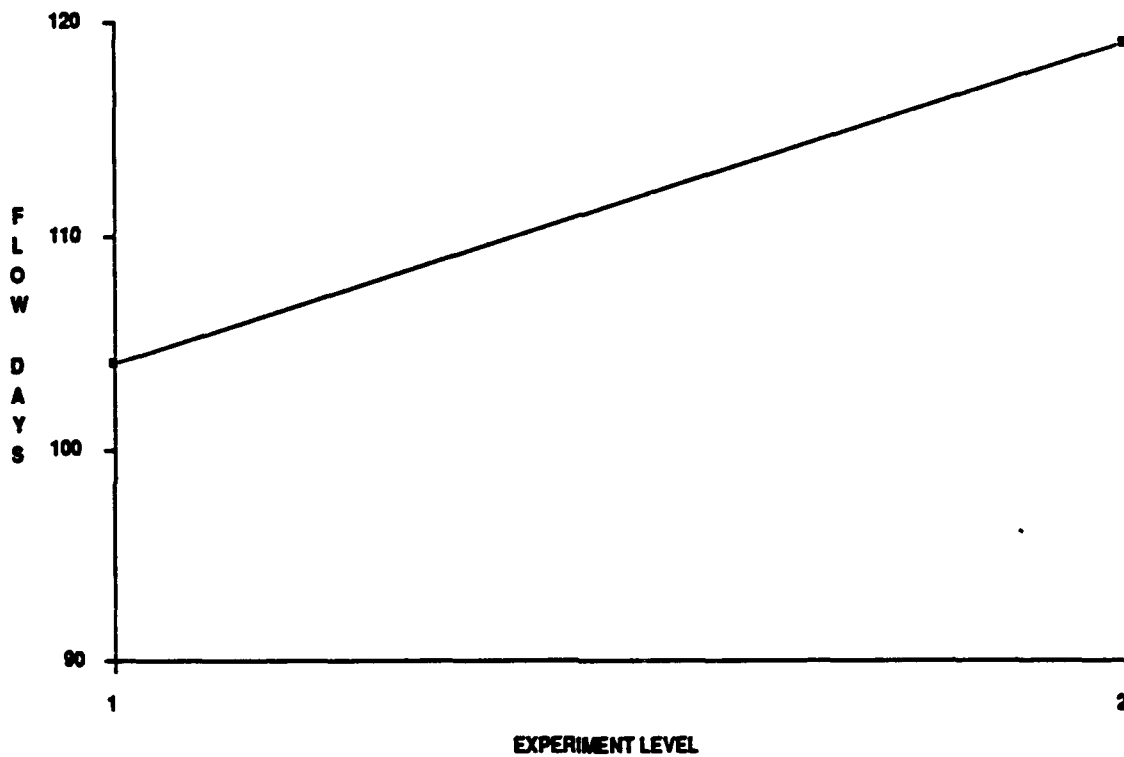


MINOR EFFECT

20816

FACTOR 8 - AS IS ON 50005s ONLY
FIGURE 8.2.1.3-8

081031



SIGNIFICANT EFFECT

20817

FACTOR 15 - 2% OT CAP
FIGURE 8.2.1.3-9

081032



SIGNIFICANT EFFECT

20818

FACTOR 15 - 2% OT CAP
FIGURE 8.2.1.3-10

081033

ENGINEERING NOTES

EMPLOYEE GARDNERDATE 6 Oct 90

PAGE NO. _____

RCC MAIPEASUBJECT Interaction charts

The following charts show the effects of interactions between experimental factors at different levels, as included in the $L(16)$ Taguchi Orthogonal array.

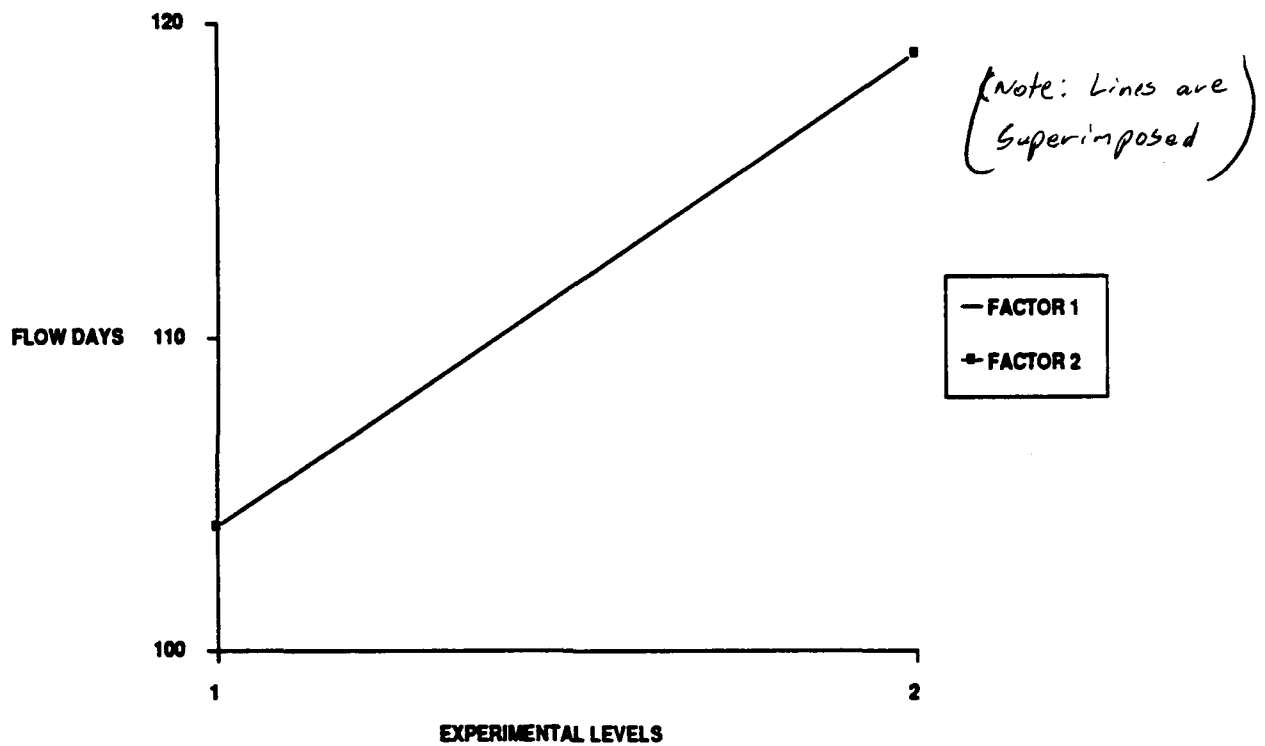
An interaction occurs when one factor ~~meets~~ responds differently at different levels, when the level of a second factor is changed. For example

FACTOR 1: in a shop with 20 workers, splitting them into 2 shifts may produce a sharp decrease in flowtime. This would mean that for FACTOR 1 (shift schedules), Level 2 (2 shifts) would produce better results than Level 1 (1 shift).

FACTOR 2-But: When the manpower is doubled (FACTOR 2/Level 2) the effect of going to 2 shifts (FACTOR 1/Level 2) is substantially reduced.

: in This case FACTORS 1 & 2 are said to interact.

Graphically, when both factors are graphed at both levels, ~~the~~ an interaction appears as non-parallel lines. Lines which approach parallel (not crossed or crossed at an acute angle) indicate very weak interactions. Lines which are perpendicular or nearly so indicate very pronounced interactions. Normally, when the interaction is so weak that the lines do not intersect (within the range of the levels selected) the Factors are said to have no interaction.

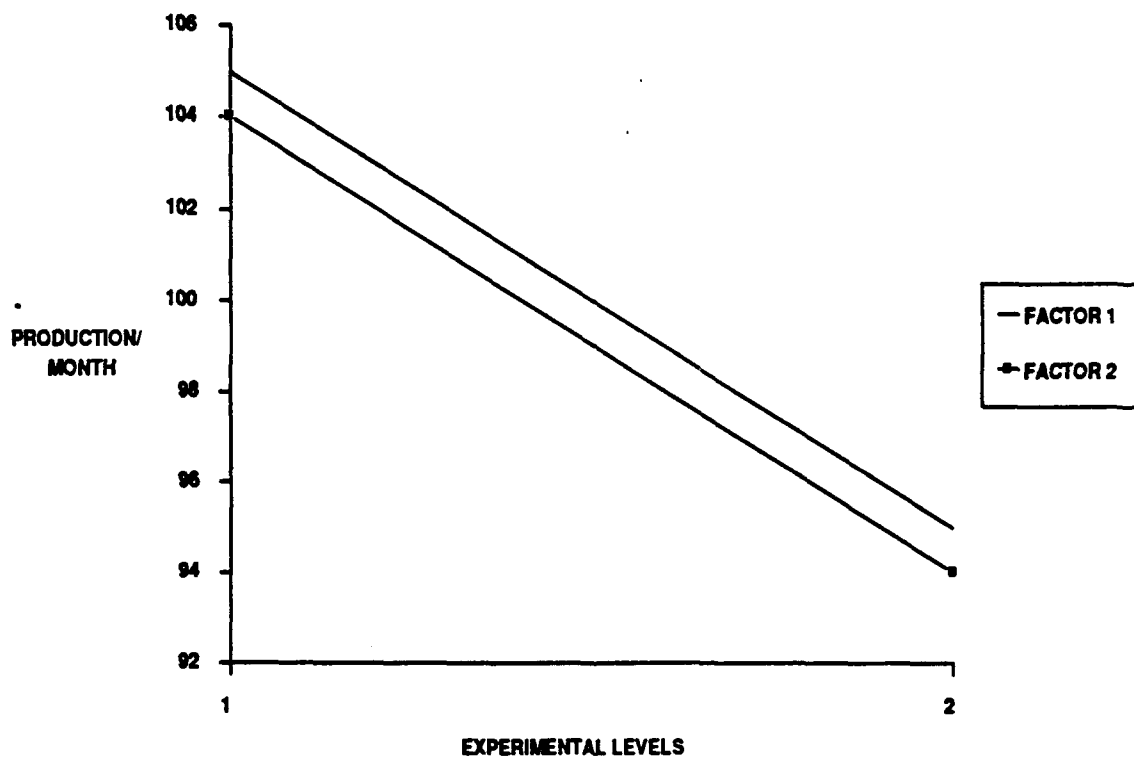


NO INTERACTION

20788

1 X 15 FLOW TIME
FIGURE 8.2.1.3-11

081035

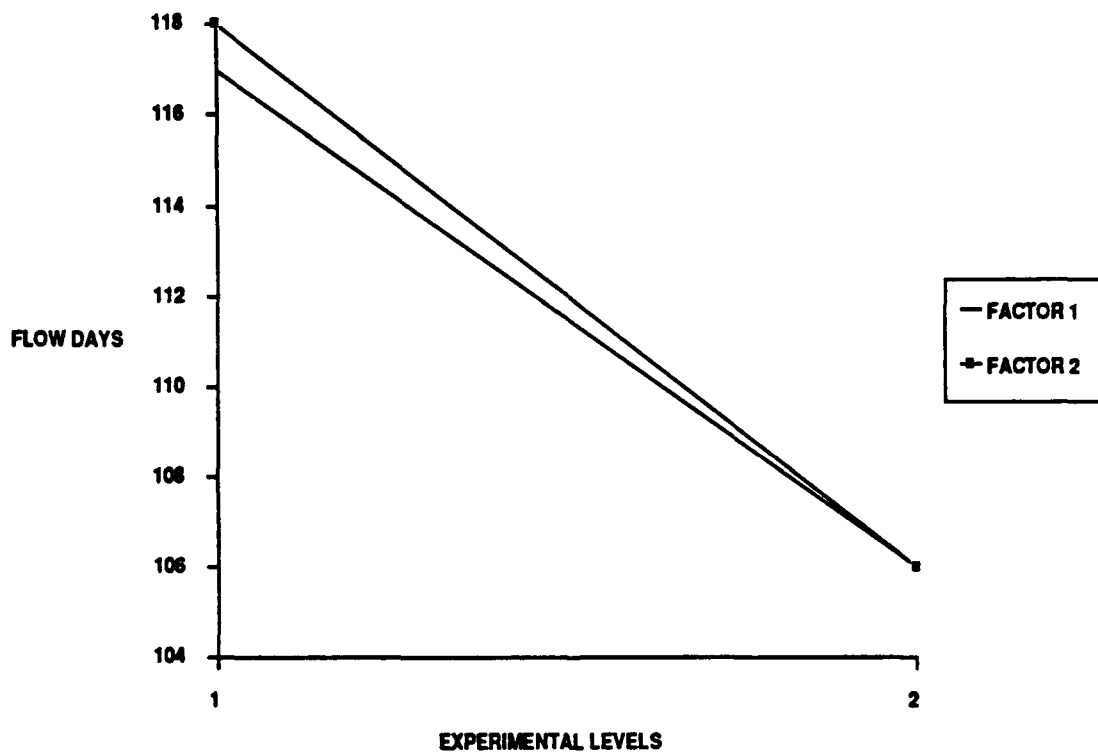


NO INTERACTION

20789

1 X 15 PRODUCTION
FIGURE 8.2.1.3-12

081036

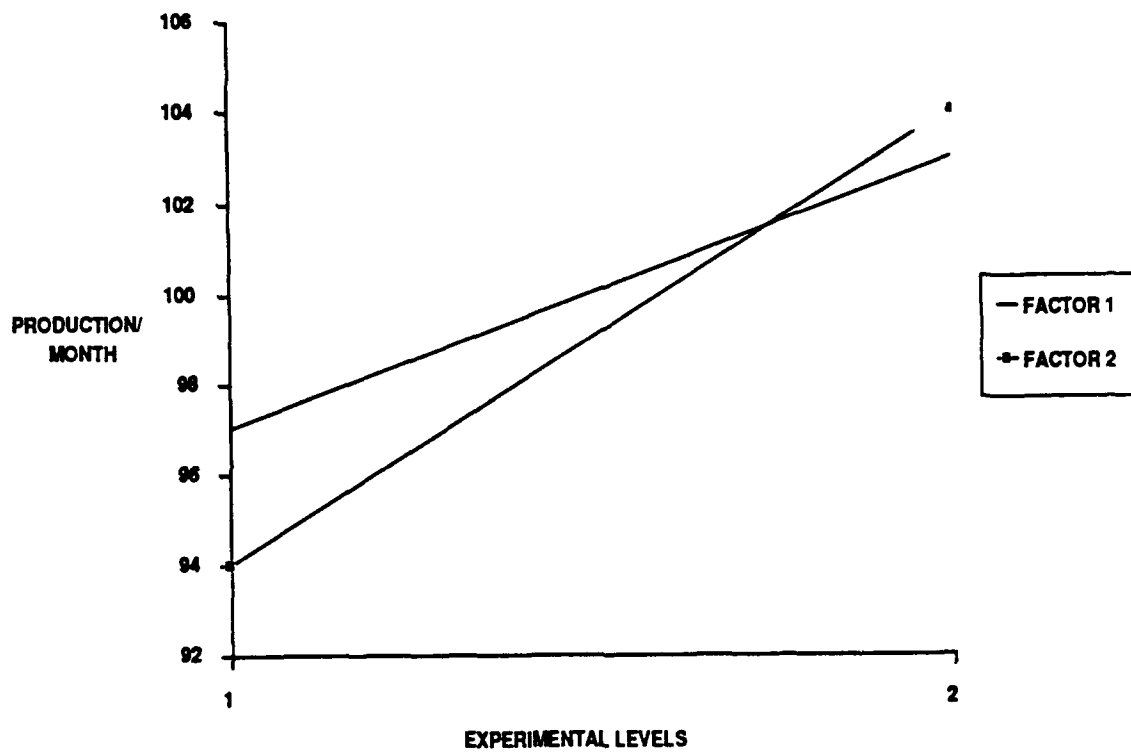


NO INTERACTION

20790

1 X 2 FLOW TIME
FIGURE 8.2.1.3-13

081037

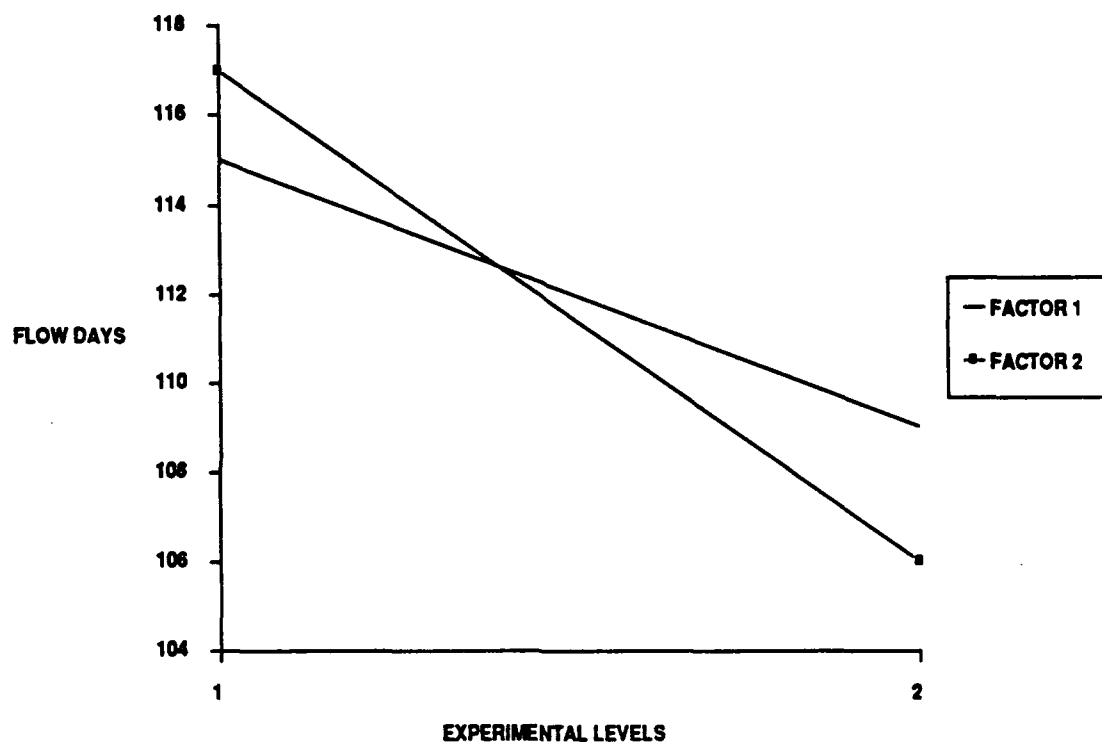


MILD INTERACTION

20791

1 X 2 PRODUCTION
FIGURE 8.2.1.3-14

081038

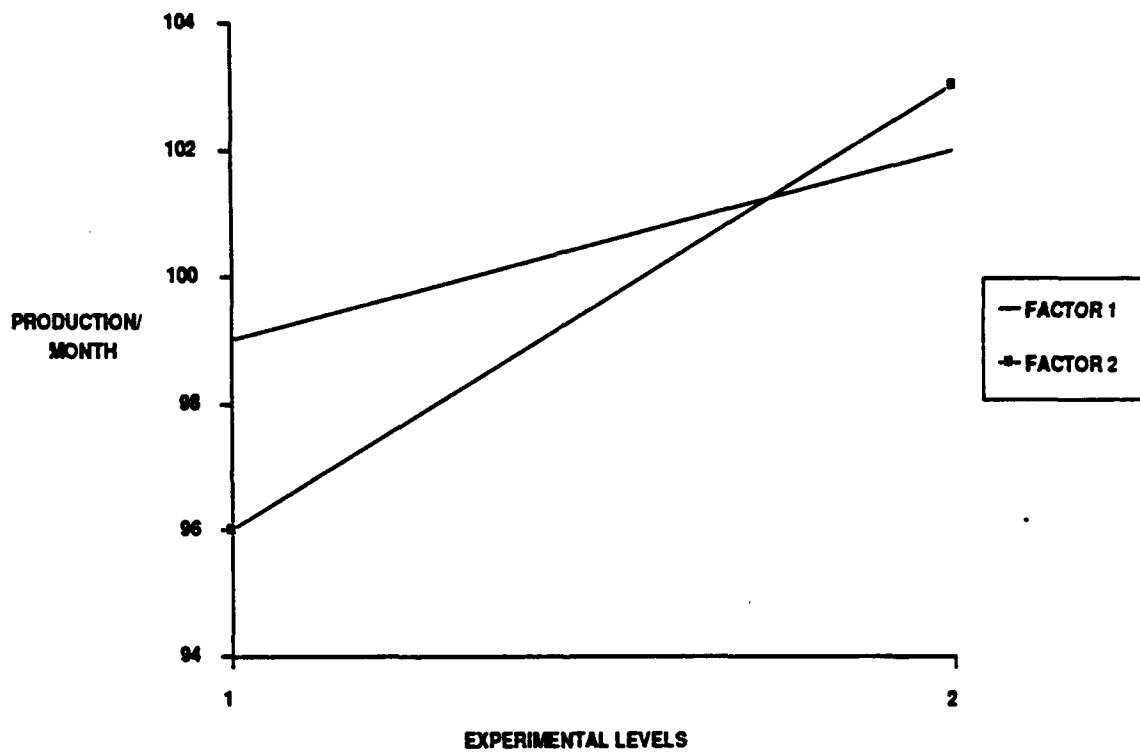


MILD INTERACTION

20792

1 X 4 FLOW TIME
FIGURE 8.2.1.3-15

081039

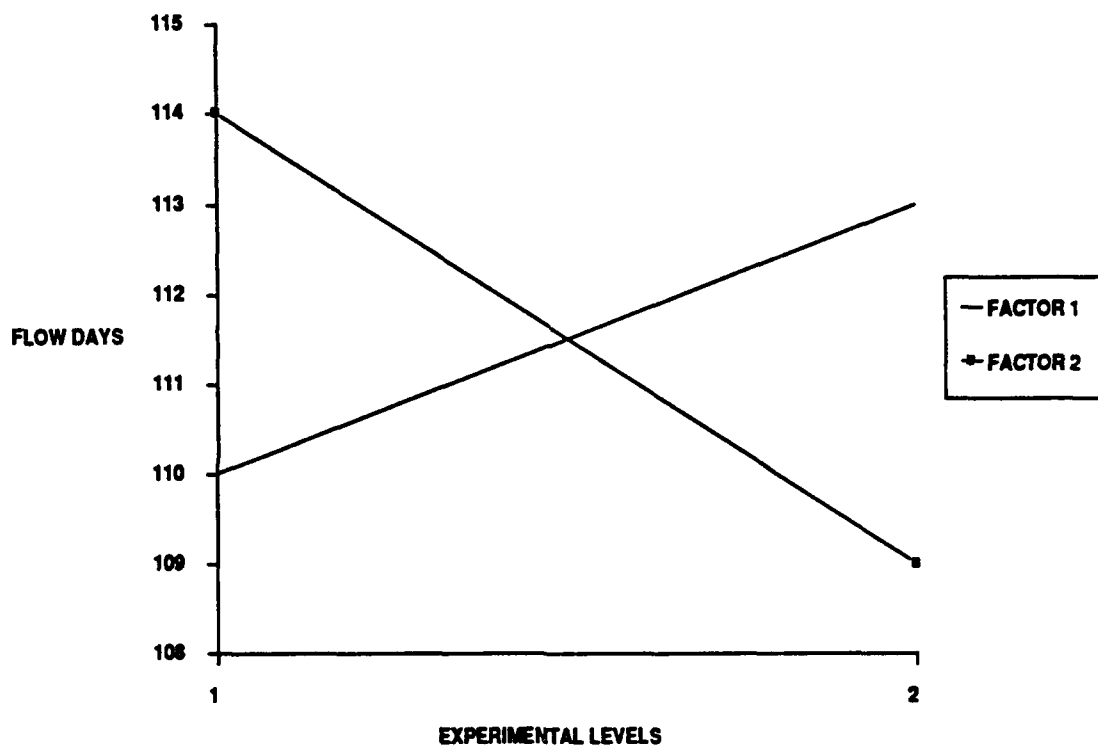


MILD INTERACTION

20793

1 X 4 PRODUCTION
FIGURE 8.2.1.3-16

081040

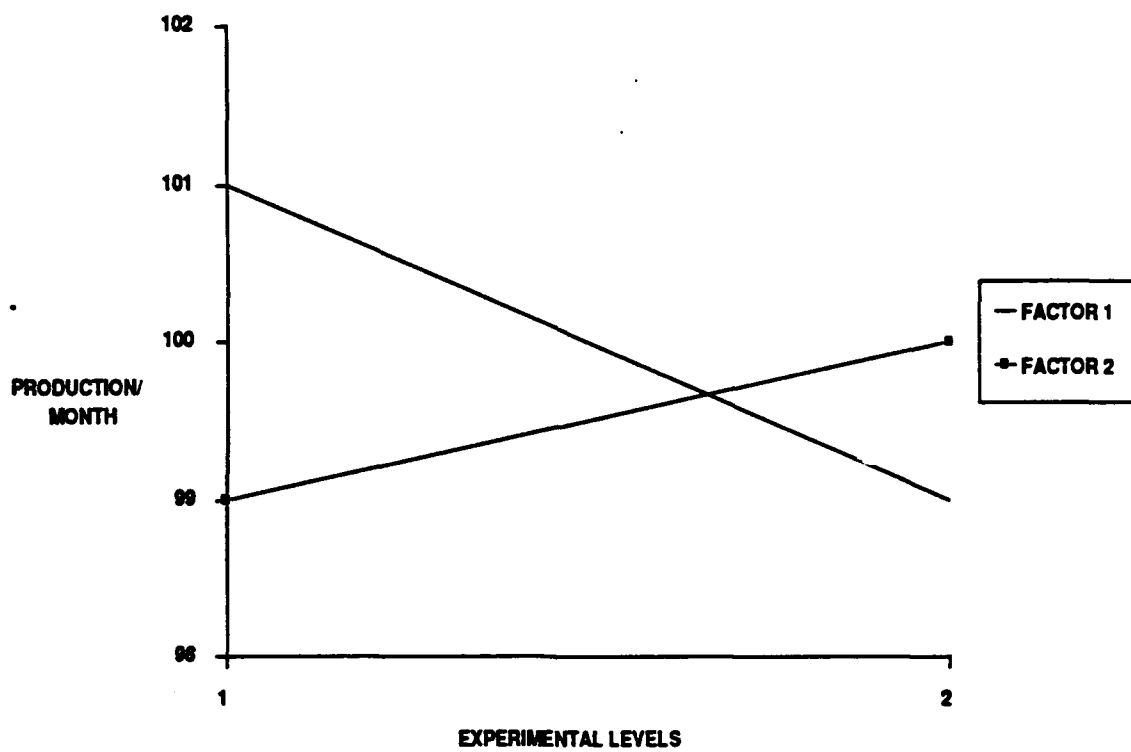


STRONG INTERACTION

20794

1 X 8 FLOW TIME
FIGURE 8.2.1.3-17

081041

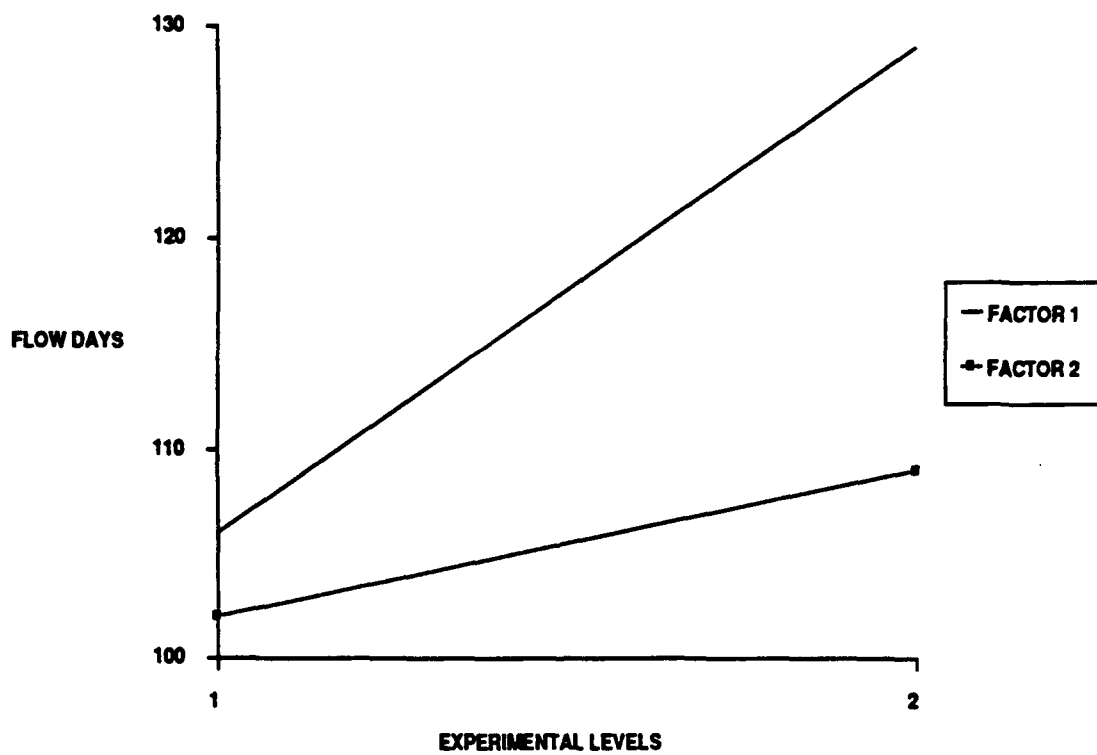


STRONG INTERACTION

20795

1 X 8 PRODUCTION
FIGURE 8.2.1.3-18

081042

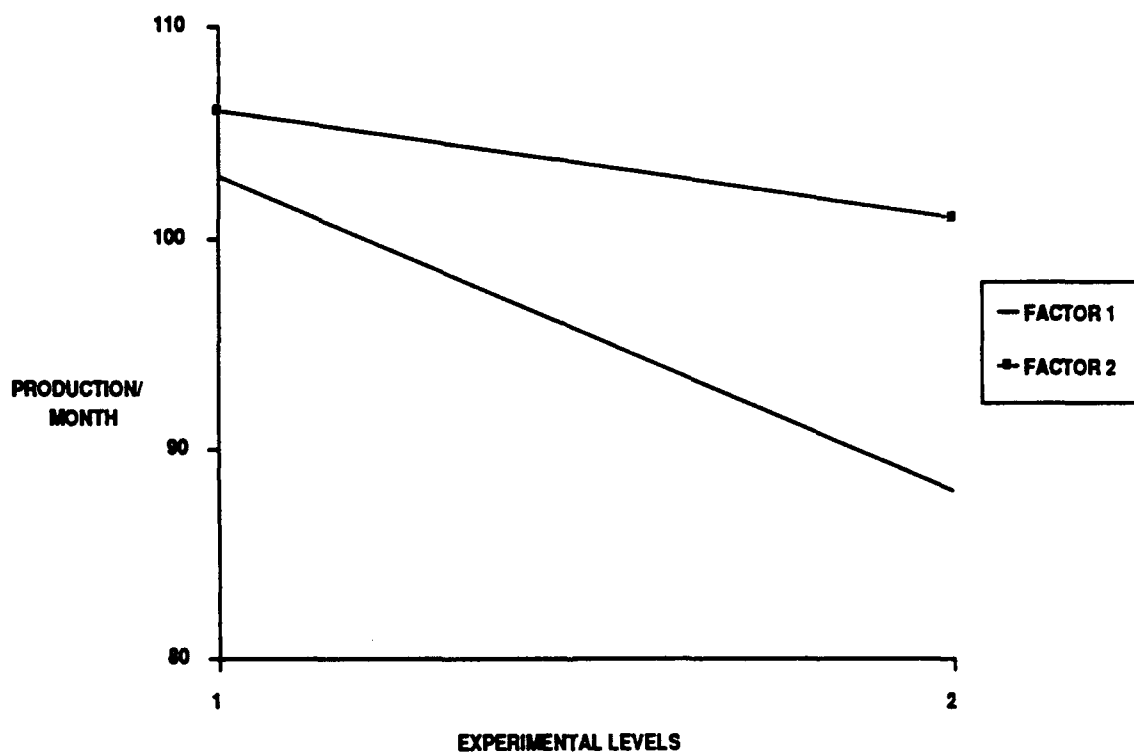


NO INTERACTION

20796

2 X 15 FLOW TIME
FIGURE 8.2.1.3-19

081043

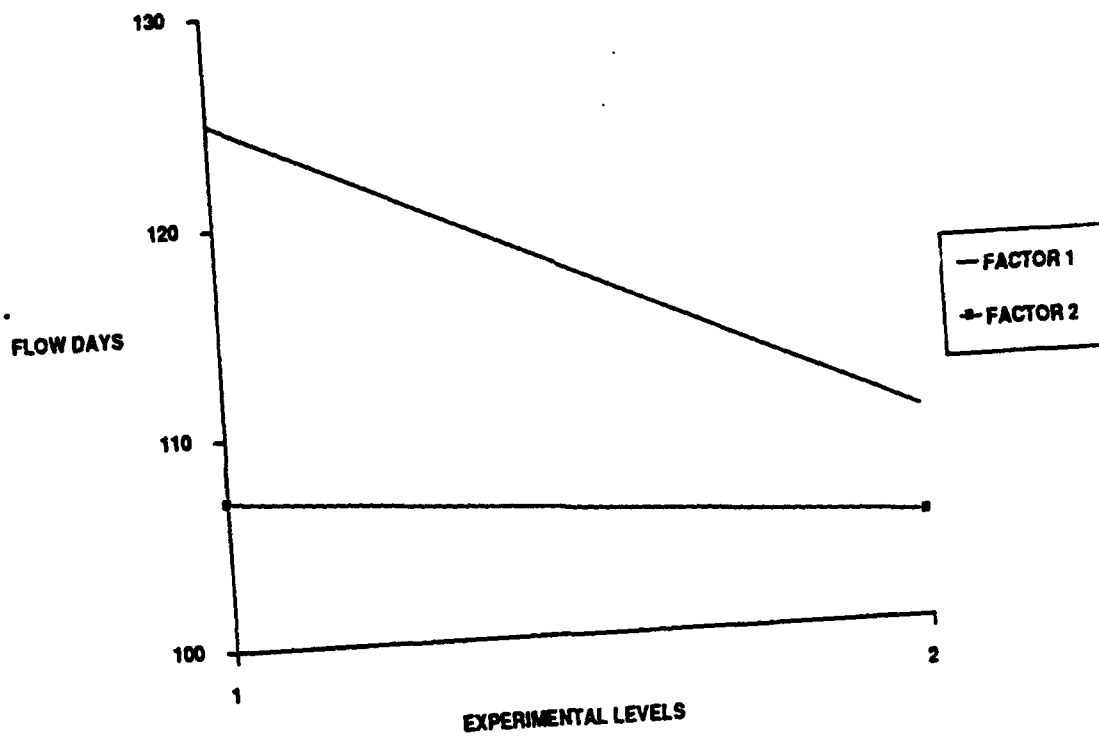


NO INTERACTION

20797

2 X 15 PRODUCTION
FIGURE 8.2.1.3-20

081044

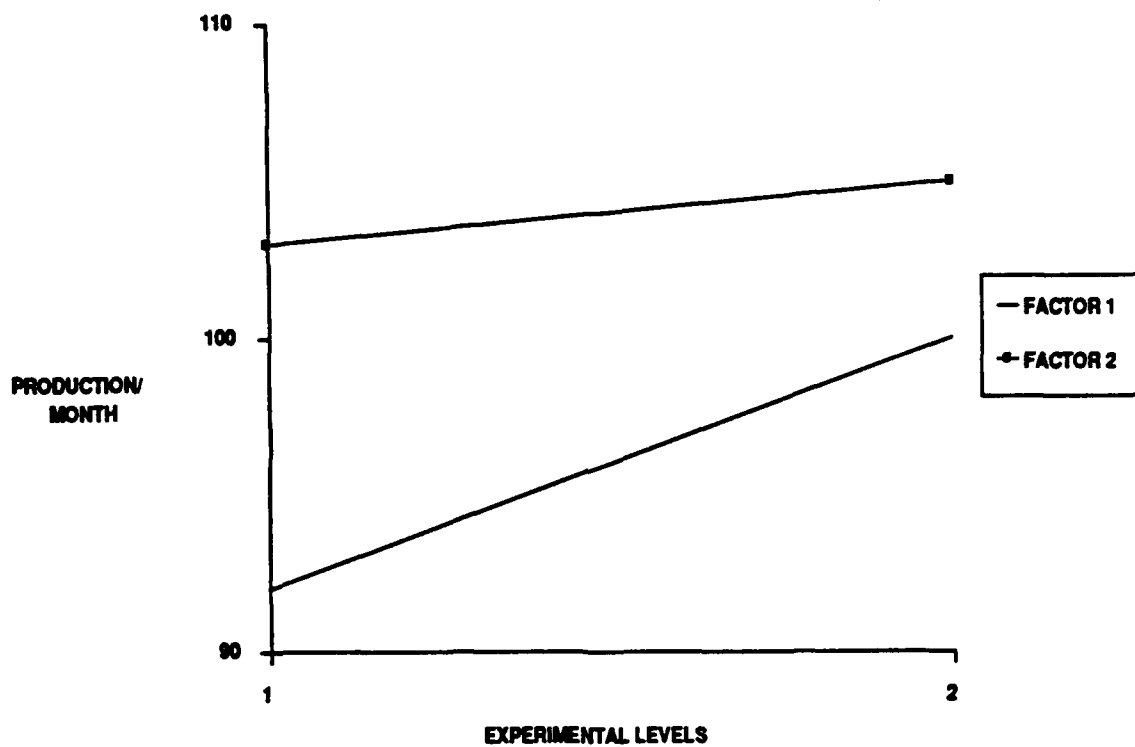


NO INTERACTION

20798

2 X 4 FLOW TIME
FIGURE 8.2.1.3-21

081045

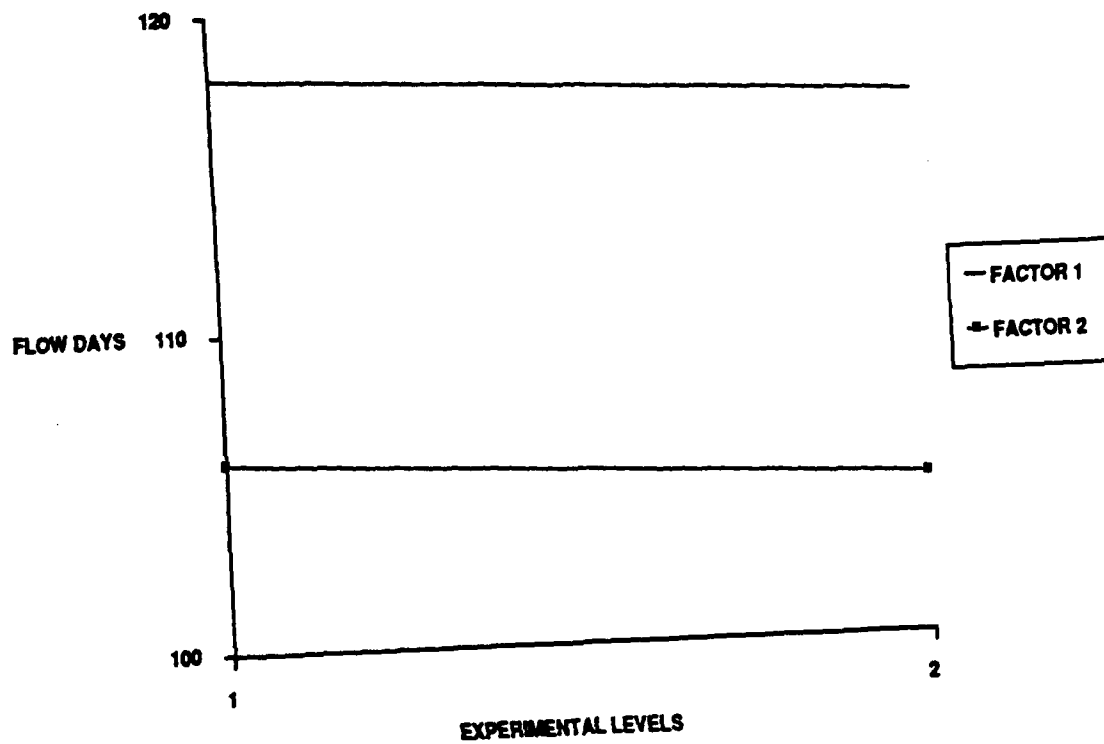


NO INTERACTION

20799

2 X 4 PRODUCTION
FIGURE 8.2.1.3-22

081046

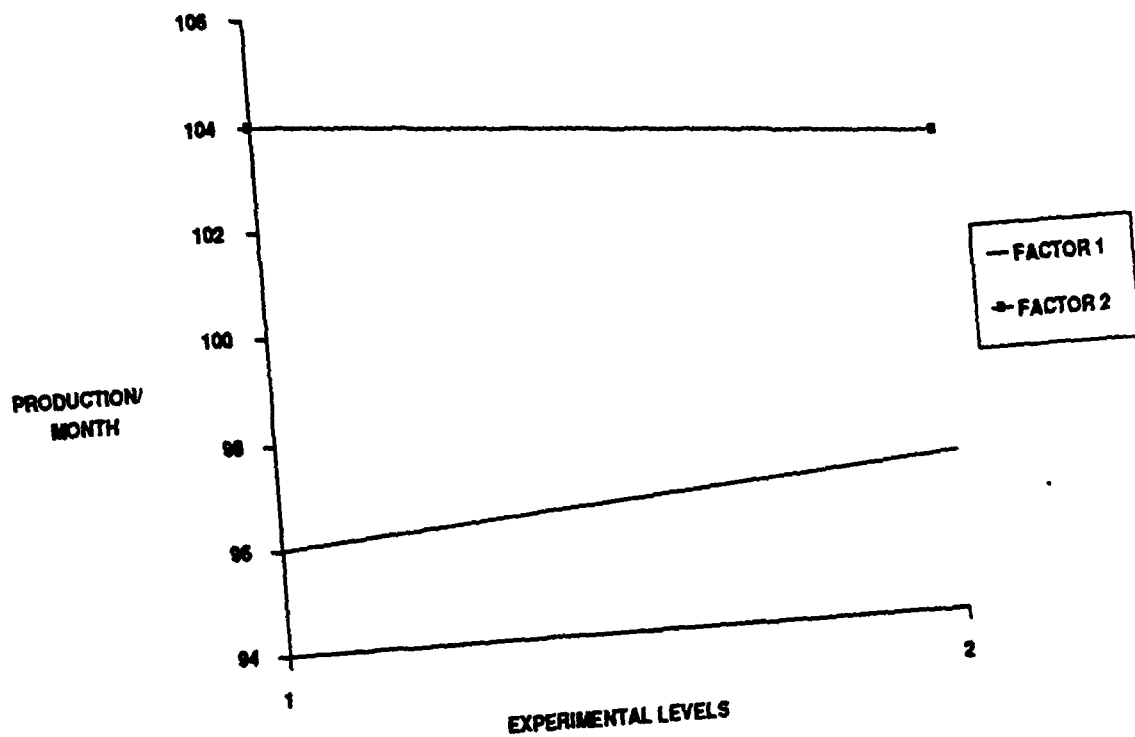


NO INTERACTION

20800

2 X 8 FLOW TIME
FIGURE 8.2.1.3-23

081047

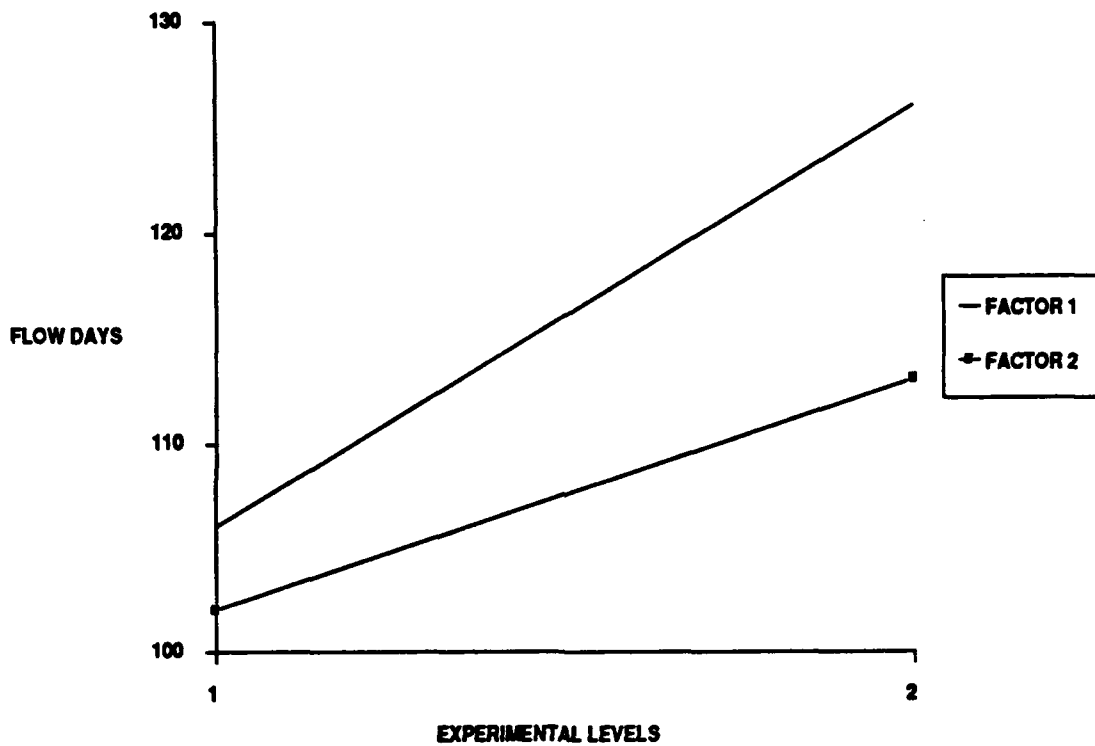


NO INTERACTION

20801

2 X 8 PRODUCTION
FIGURE 8.2.1.3-24

081048

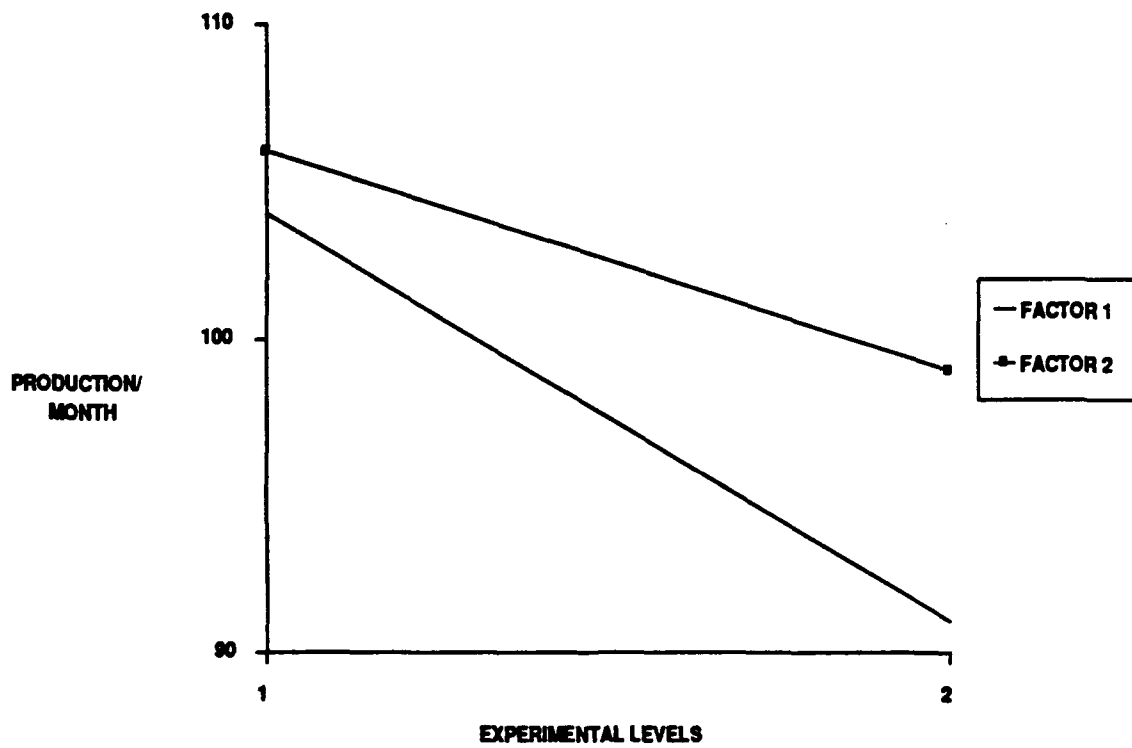


NO INTERACTION

20802

4 X 15 FLOW TIME
FIGURE 8.2.1.3-25

081049

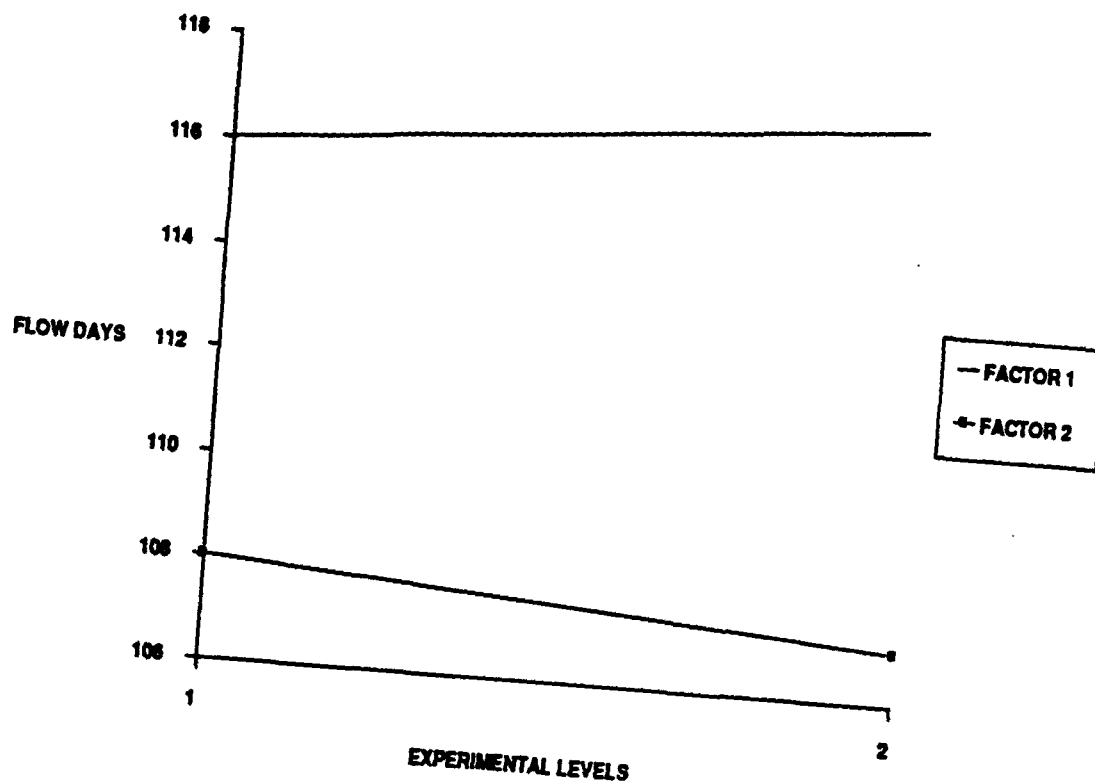


NO INTERACTION

20803

4 X 15 PRODUCTION
FIGURE 8.2.1.3-26

081030

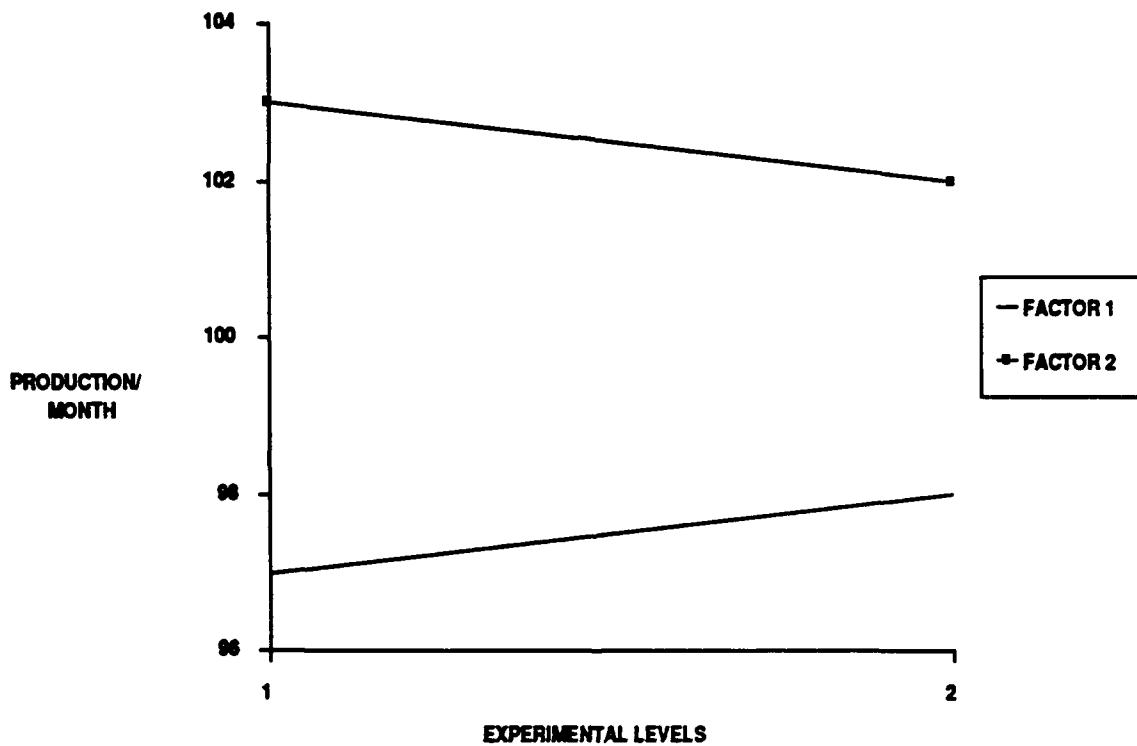


NO INTERACTION

20804

4 X 8 FLOW TIME
FIGURE 8.2.1.3-27

081031

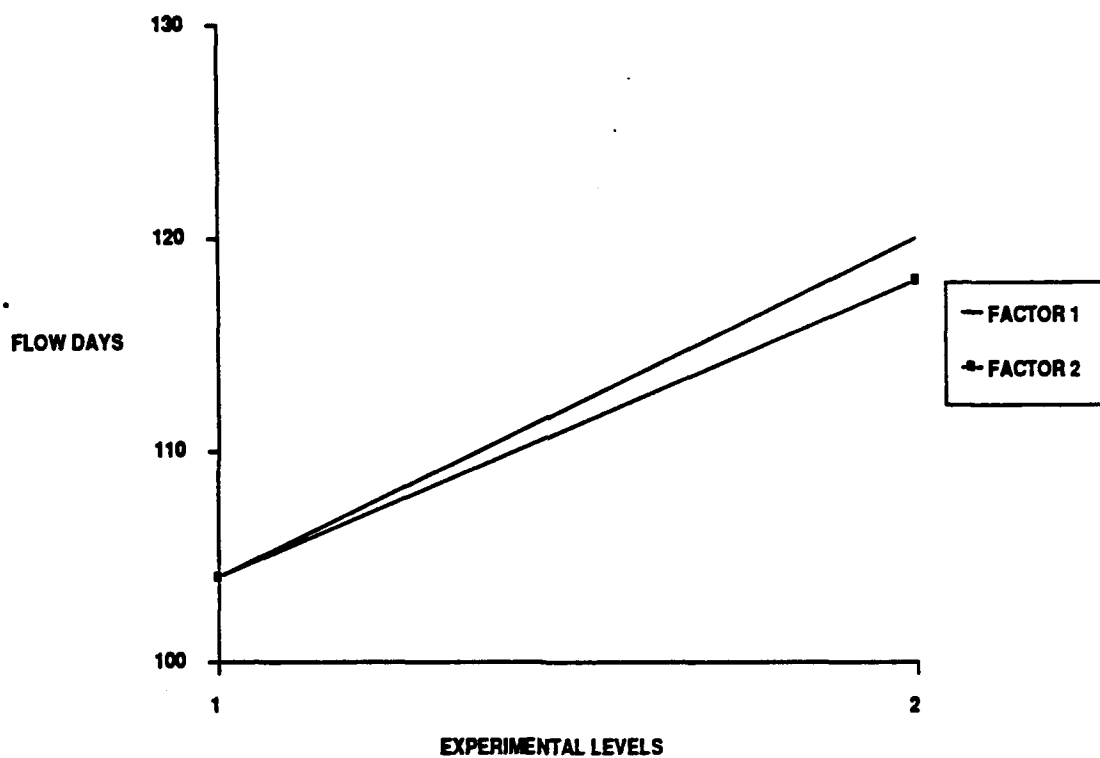


NO INTERACTION

20805

4 X 8 PRODUCTION
FIGURE 8.2.1.3-28

081032

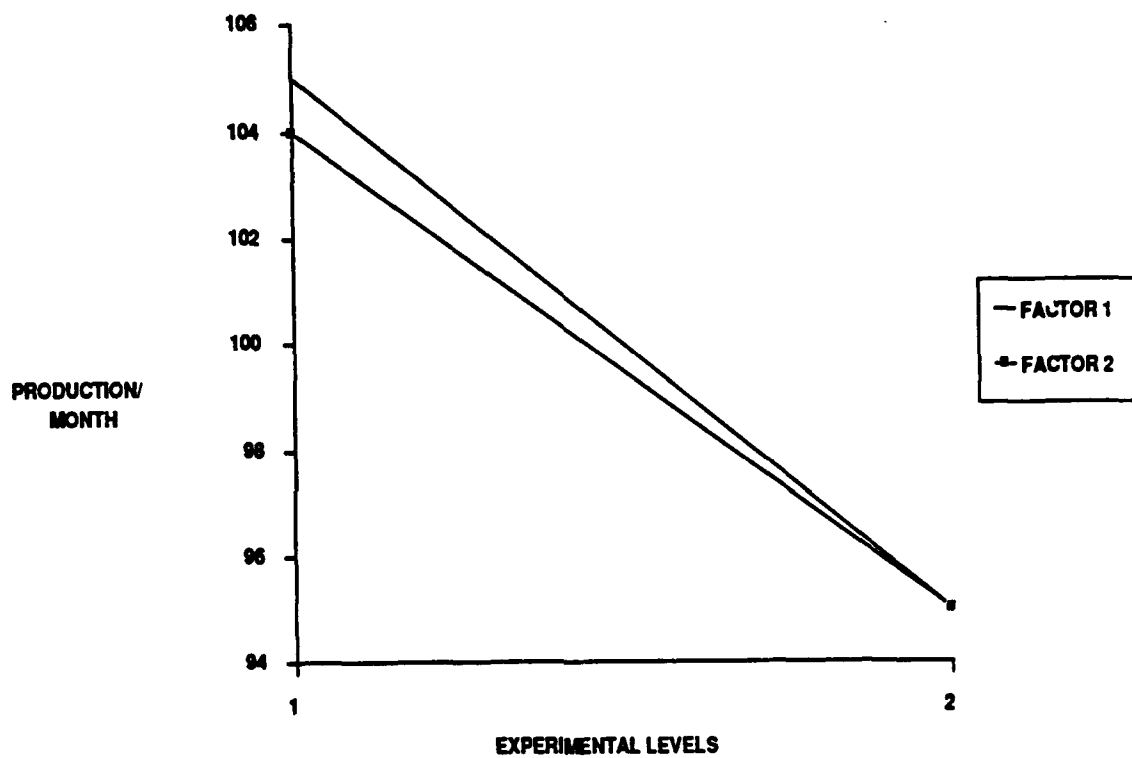


NO INTERACTION

20806

8 X 15 FLOW TIME
FIGURE 8.2.1.3-29

081033



NO INTERACTION

20807

8 X 15 PRODUCTION
FIGURE 8.2.1.3-30

081054

EXPERIMENT 1

RUN 1

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	87.09	32.96	133	439
AC/DB	127.02	77.85	440	890
DB	27.48	16.98	20	439
F-15QT	357.54	215.1	146	158
F-15SQT	241.51	247.63	2	2
F-15ST	3669.73	2305.46	342	368
F-16QT	361.66	207.86	222	238
F-16SQT	217.74	112.5	2	2
F-16ST	3876.14	2531.67	495	552
GG	67.09	49.56	445	890

THREE RUN AVERAGE

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	88	36	139	445
AC/DB	120	74	444	884
DB	24	15	15	445
F-15QT	270	155	151	158
F-15SQT	126	89	2	2
F-15ST	3620	2363	343	368
F-16QT	277	163	232	238
F-16SQT	121	58	2	2
F-16ST	3651	2431	505	552
GG	65	45	450	883

RUN 2

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	87.67	38.51	135	430
AC/DB	113.06	68.71	429	860
DB	20.55	11.23	9	430
F-15QT	186.36	85.51	156	158
F-15SQT	41.93	12.89	2	2
F-15ST	3569	2419.92	347	368
F-16QT	188.05	93.93	244	238
F-16SQT	108.93	61.3	2	2
F-16ST	3420.64	2286.29	502	552
GG	61.58	40.15	454	859

THREE RUN STANDARD DEVIATION

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	0	3	9	19
AC/DB	7	5	17	22
DB	3	3	6	19
F-15QT	86	65	5	0
F-15SQT	104	137	0	0
F-15ST	50	57	4	0
F-16QT	87	61	11	0
F-16SQT	92	56	1	0
F-16ST	228	129	12	0
GG	3	5	5	21

RUN 3

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	88.04	36.83	150	466
AC/DB	120.04	74.03	463	902
DB	23.81	16.89	15	466
F-15QT	266.49	165.68	151	158
F-15SQT	93.35	6.24	2	2
F-15ST	3621.33	2362.99	339	368
F-16QT	281.84	186.19	231	238
F-16SQT	35.56	0	1	2
F-16ST	3657.44	2475.37	519	552
GG	67.52	46.09	452	900

		Average Flowdays	Monthly Prod
F-15	Run #1	111	41
	Run #2	105	42
	Run #3	107	41
	Average	108	41
	St Dev	3	1
F-16	Run #1	116	60
	Run #2	98	62
	Run #3	109	63
	Average	108	62
	St Dev	9	1
F-15 & F-16	Run #1	114	101
	Run #2	101	104
	Run #3	108	104
Average		108	103
St Dev		7	2

081055

EXPERIMENT 2

RUN 1

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	112.17	54.37	115	427
AC/DB	214.67	141.3	418	822
DB	44.33	32.04	12	427
F-15QT	797.87	638.43	127	158
F-15SQT	876.24	786.86	2	2
F-15ST	4204.82	2407.89	279	368
F-16QT	760.04	575.28	196	238
F-16SQT	839.16	921.24	2	2
F-16ST	4457.68	2460.88	399	552
GG	129.19	92.34	396	825

THREE RUN AVERAGE

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	109	52	121	429
AC/DB	230	153	414	818
DB	40	28	13	429
F-15QT	1015	593	129	158
F-15SQT	834	540	2	2
F-15ST	4446	2402	279	368
F-16QT	1003	570	203	238
F-16SQT	538	307	1	2
F-16ST	4515	2433	400	552
GG	128	93	409	822

RUN 2

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	111.86	54.19	128	413
AC/DB	194.86	115.88	408	798
DB	32.28	25.39	11	413
F-15QT	1102.86	704.02	126	158
F-15SQT	656.68	561.02	3	2
F-15ST	4449.81	2413.99	263	368
F-16QT	1070.13	688.01	200	238
F-16SQT	335.9	0	1	2
F-16ST	4485.29	2441.31	392	552
GG	109.91	78.04	414	802

THREE RUN STANDARD DEVIATION

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	5	3	7	17
AC/DB	45	45	5	19
DB	7	3	3	17
F-15QT	189	140	4	0
F-15SQT	160	258	1	0
F-15ST	240	16	16	0
F-16QT	218	121	9	0
F-16SQT	266	532	1	0
F-16ST	76	33	9	0
GG	18	16	11	19

RUN 3

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	103.12	48.22	120	447
AC/DB	280.12	203.12	416	835
DB	43.71	27.54	17	447
F-15QT	1143.44	435.86	134	158
F-15SQT	968.65	272.25	2	2
F-15ST	4684.26	2384.54	295	368
F-16QT	1179.46	447.07	213	238
F-16SQT	439.5	0	1	2
F-16ST	4601.38	2397.29	410	552
GG	145.98	109.25	417	840

		Average Flowdays	Monthly Prod
F-15	Run #1	130	34
	Run #2	139	33
	Run #3	149	36
	Average	139	34
	St Dev	9	2
F-16	Run #1	135	50
	Run #2	139	49
	Run #3	143	52
	Average	139	50
	St Dev	4	1
F-15 & F-16	Run #1	133	84
	Run #2	139	82
	Run #3	145	88
Average		139	85
St Dev		6	3

EXPERIMENT 3

RUN 1

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	124.13	47.52	139	432
AC/DB	287.49	226.88	419	866
DB	33.79	18.2	16	432
F-15QT	546.01	428.28	139	158
F-15SQT	224.3	271.84	2	2
F-15ST	4243.57	2583.65	313	368
F-16QT	559.04	450.87	210	238
F-16SQT	381.7	255.91	2	2
F-16ST	4150.53	2463.75	431	552
GG	158.05	118.38	433	882

THREE RUN AVERAGE

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	129	51	128	422
AC/DB	250	175	411	859
DB	42	25	15	422
F-15QT	497	345	144	158
F-15SQT	191	140	2	2
F-15ST	4045	2571	312	368
F-16QT	499	342	219	238
F-16SQT	284	212	2	2
F-16ST	3947	2394	463	552
GG	141	98	447	874

RUN 2

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	127.13	54.66	133	415
AC/DB	248.4	174.52	407	858
DB	48.87	33.66	12	415
F-15QT	500.57	269.49	148	158
F-15SQT	247.7	77.94	3	2
F-15ST	4051.88	2562.26	314	368
F-16QT	473.19	257.3	225	238
F-16SQT	388.25	379.3	2	2
F-16ST	3847.43	2390.93	470	552
GG	141.37	92.54	469	882

THREE RUN STANDARD DEVIATION

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	6	4	14	9
AC/DB	37	52	7	7
DB	8	8	2	9
F-15QT	51	80	5	0
F-15SQT	78	114	1	0
F-15ST	202	11	3	0
F-16QT	52	99	8	0
F-16SQT	175	193	1	0
F-16ST	176	68	29	0
GG	18	18	19	14

RUN 3

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	136.3	51.56	113	419
AC/DB	214.49	122.76	407	852
DB	42.36	23.99	16	419
F-15QT	444.57	336.23	144	158
F-15SQT	101.92	71.15	2	2
F-15ST	3840.32	2566.36	309	368
F-16QT	465.74	319.25	222	238
F-16SQT	81.07	0	1	2
F-16ST	3842.55	2327.27	488	552
GG	122.45	83.31	440	857

		Average Flowdays	Monthly Prod
F-15	Run #1	129	38
	Run #2	121	39
	Run #3	115	38
	Average	121	38
	St Dev	7	1
F-16	Run #1	124	54
	Run #2	115	58
	Run #3	116	59
	Average	118	57
	St Dev	5	3
F-15 & F-16	Run #1	126	91
	Run #2	117	97
	Run #3	115	97
Average		119	95
St Dev		6	3

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EXPERIMENT 4

RUN 1

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	88.65	37.19	131	450
AC/DB	116.88	67.12	449	906
DB	21.77	12.36	7	450
F-15QT	149.27	62.59	152	158
F-15SQT	49.58	10.97	2	2
F-15ST	3543.94	2581.68	355	368
F-16QT	163.28	73.19	234	238
F-16SQT	45.71	15.09	2	2
F-16ST	3505.27	2414.48	511	552
GG	62.17	41.71	478	902

THREE RUN AVERAGE

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	93	40	136	448
AC/DB	121	70	447	893
DB	27	14	14	448
F-15QT	160	69	156	158
F-15SQT	57	15	2	2
F-15ST	3482	2436	352	368
F-16QT	166	75	239	238
F-16SQT	62	45	2	2
F-16ST	3573	2453	513	552
GG	64	44	451	892

RUN 2

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	93.09	40.39	128	434
AC/DB	116.89	67.35	434	858
DB	31.28	22.99	20	434
F-15QT	171.55	80.39	153	158
F-15SQT	36.49	5.05	2	2
F-15ST	3421.96	2329.61	344	368
F-16QT	173.78	81.66	241	238
F-16SQT	80.42	80.22	2	2
F-16ST	3670.26	2545.63	501	552
GG	61.17	41.85	431	860

THREE RUN STANDARD DEVIATION

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	4	3	11	14
AC/DB	7	4	12	30
DB	5	8	7	14
F-15QT	11	10	6	0
F-15SQT	24	12	0	0
F-15ST	61	131	7	0
F-16QT	7	6	5	0
F-16SQT	17	33	0	0
F-16ST	86	81	13	0
GG	4	4	24	28

RUN 3

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	96.63	42.5	148	461
AC/DB	129.72	74.72	457	914
DB	26.66	7.74	14	461
F-15QT	157.85	64.4	162	158
F-15SQT	83.71	28.04	2	2
F-15ST	3480.09	2396.62	357	368
F-16QT	161.74	70.92	243	238
F-16SQT	59.99	39.04	2	2
F-16ST	3544.56	2397.91	527	552
GG	68.76	48.32	445	913

		Average Flowdays	Monthly Prod
F-15	Run #1	105	42
	Run #2	100	42
	Run #3	101	43
	Average	102	42
	St Dev	2	1
F-16	Run #1	102	62
	Run #2	105	62
	Run #3	103	64
	Average	103	63
	St Dev	2	1
F-15 & F-16	Run #1	103	105
	Run #2	103	104
	Run #3	102	108
Average		103	106
St Dev		1	2

081058

EXPERIMENT 5

RUN 1

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	114.62	45.84	138	403
AC/DB	205.84	141.45	399	876
DB	31.66	27.74	11	403
F-15QT	233.18	117.26	152	158
F-15SQT	128.24	35.03	2	2
F-15ST	3457.02	2354.82	355	368
F-16QT	238.45	107.82	238	238
F-16SQT	86.21	61.11	2	2
F-16ST	3573.87	2371.62	527	552
GG	123.82	83.66	438	877

THREE RUN AVERAGE

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	116	50	135	413
AC/DB	262	200	403	853
DB	33	25	12	413
F-15QT	272	156	151	158
F-15SQT	146	75	2	2
F-15ST	3619	2343	321	368
F-16QT	267	142	231	238
F-16SQT	118	95	2	2
F-16ST	3838	2495	496	552
GG	170	121	421	867

RUN 2

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	115.99	55.11	123	413
AC/DB	212.27	154.74	415	826
DB	37.7	23.66	14	413
F-15QT	317.24	230.24	146	158
F-15SQT	164.57	143.63	3	2
F-15ST	3760.17	2415.09	310	368
F-16QT	298.92	204.58	223	238
F-16SQT	186.09	223.77	2	2
F-16ST	3915.97	2485.23	469	552
GG	132.37	92.65	418	838

THREE RUN STANDARD DEVIATION

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	1	5	11	11
AC/DB	91	91	11	25
DB	4	2	2	11
F-15QT	42	64	5	0
F-15SQT	18	60	1	0
F-15ST	153	79	30	0
F-16QT	30	54	8	0
F-16SQT	59	116	1	0
F-16ST	235	128	29	0
GG	72	58	15	26

RUN 3

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	117.46	49.09	144	424
AC/DB	366.4	304.61	394	858
DB	30.99	23.97	12	424
F-15QT	265.21	120.86	155	158
F-15SQT	145.16	45.67	2	2
F-15ST	3640.39	2259	298	368
F-16QT	262.23	113.41	233	238
F-16SQT	82.65	0	1	2
F-16ST	4024.2	2627.26	492	552
GG	253.35	187.82	408	886

		Average Flowdays	Monthly Prod
F-15	Run #1	103	42
	Run #2	110	38
	Run #3	103	38
	Average	106	40
	St Dev	4	3
F-16	Run #1	105	64
	Run #2	114	58
	Run #3	117	61
	Average	112	61
	St Dev	6	3
F-15 & F-16	Run #1	105	106
	Run #2	113	96
	Run #3	112	98
Average		110	100
St Dev		4	5

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EXPERIMENT 6

RUN 1

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	81.14	35.53	134	457
AC/DB	118.8	70.1	449	922
DB	25.22	17.29	13	457
F-15QT	138.4	61.09	153	158
F-15SQT	80.79	0.03	2	2
F-15ST	3485.29	2433.14	353	368
F-16QT	149.69	69.7	234	238
F-16SQT	77.91	74.91	2	2
F-16ST	3543.5	2392.65	527	552
GG	65.46	46.22	481	924

THREE RUN AVERAGE

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	85	36	133	440
AC/DB	121	72	436	899
DB	27	17	13	440
F-15QT	151	83	156	158
F-15SQT	73	14	2	2
F-15ST	3430	2387	346	368
F-16QT	159	88	239	238
F-16SQT	68	28	2	2
F-16ST	3567	2367	526	552
GG	66	47	463	901

RUN 2

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	84.65	34.6	132	458
AC/DB	118.75	69.69	454	905
DB	21.91	7.87	13	458
F-15QT	135.83	64.81	156	158
F-15SQT	93.95	26.74	3	2
F-15ST	3362.86	2267.38	356	368
F-16QT	140.5	59.94	245	238
F-16SQT	85.91	7.68	2	2
F-16ST	3523.5	2354.53	539	552
GG	69.62	50.9	463	904

THREE RUN STANDARD DEVIATION

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	4	1	1	31
AC/DB	3	3	28	27
DB	6	8	1	31
F-15QT	24	34	3	0
F-15SQT	26	13	1	0
F-15ST	62	105	15	0
F-16QT	24	40	6	0
F-16SQT	24	41	1	0
F-16ST	59	23	13	0
GG	3	4	18	25

RUN 3

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	89.68	37.1	132	404
AC/DB	124.63	75.89	404	870
DB	33.29	24.67	12	404
F-15QT	177.93	122.12	158	158
F-15SQT	44.46	15.72	2	2
F-15ST	3442.79	2460.7	328	368
F-16QT	185.31	132.95	239	238
F-16SQT	40.56	0	1	2
F-16ST	3633.4	2352.48	513	552
GG	63.06	42.96	446	875

		Average Flowdays	Monthly Prod
F-15	Run #1	103	42
	Run #2	99	43
	Run #3	99	41
	Average	100	42
	St Dev	2	1
F-16	Run #1	104	64
	Run #2	103	66
	Run #3	106	63
	Average	104	64
	St Dev	2	1
F-15 & F-16	Run #1	103	106
	Run #2	101	108
	Run #3	103	103
Average		102	106
St Dev		1	2

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EXPERIMENT 7

RUN 1

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	96.36	39	150	489
AC/DB	123.15	78.43	486	924
DB	25.15	12.8	9	489
F-15QT	138.39	59.74	151	158
F-15SQT	62.31	16.69	2	2
F-15ST	3665.78	2555.45	338	368
F-16QT	137.4	52.6	234	238
F-16SQT	82.9	45.52	2	2
F-16ST	3518.6	2472.37	512	552
GG	67.56	46.99	467	927

THREE RUN AVERAGE

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	98	40	150	463
AC/DB	125	76	460	915
DB	29	16	8	463
F-15QT	142	63	156	158
F-15SQT	69	12	2	2
F-15ST	3660	2519	353	368
F-16QT	143	62	239	238
F-16SQT	79	33	2	2
F-16ST	3486	2407	523	552
GG	66	45	459	919

RUN 2

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	99.08	45.02	131	433
AC/DB	121.36	73.64	429	904
DB	25.4	12.14	10	433
F-15QT	137.73	57.85	155	158
F-15SQT	42.97	12.17	2	2
F-15ST	3631.17	2501.81	357	368
F-16QT	144.14	66.78	241	238
F-16SQT	89.5	21.21	2	2
F-16ST	3375.05	2378.2	518	552
GG	65.9	45.36	459	908

THREE RUN STANDARD DEVIATION

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	1	4	19	28
AC/DB	4	2	29	10
DB	6	6	2	28
F-15QT	7	7	6	0
F-15SQT	30	5	0	0
F-15ST	27	32	13	0
F-16QT	6	8	5	0
F-16SQT	12	12	0	0
F-16ST	99	57	15	0
GG	1	3	8	10

RUN 3

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	97.41	37.3	168	468
AC/DB	129.53	75.75	466	918
DB	35.93	22.76	6	468
F-15QT	150.9	70.69	162	158
F-15SQT	101.15	6.62	2	2
F-15ST	3684.22	2499.09	363	368
F-16QT	148.66	65.13	243	238
F-16SQT	65.82	32.44	2	2
F-16ST	3564.63	2369.4	540	552
GG	65.19	42.01	452	922

		Average Flowdays	Monthly Prod
F-15	Run #1	107	41
	Run #2	107	43
	Run #3	108	44
	Average	107	43
	St Dev	0	2
F-16	Run #1	102	62
	Run #2	98	63
	Run #3	104	65
	Average	101	64
	St Dev	3	2
F-15 & F-16	Run #1	104	103
	Run #2	101	106
	Run #3	106	109
Average		104	106
St Dev		2	3

EXPERIMENT 8

RUN 1

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	140.83	57.44	134	415
AC/DB	271.92	174.06	390	873
DB	31.89	21.96	12	415
F-15QT	201.63	83.62	150	158
F-15SQT	59.59	33.56	2	2
F-15ST	3618.96	2396.78	349	368
F-16QT	192.23	75.32	232	238
F-16SQT	71.73	62.2	2	2
F-16ST	3612.84	2398.73	488	552
GG	121.95	84.29	428	889

THREE RUN AVERAGE

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	131	56	140	428
AC/DB	290	189	412	873
DB	40	26	11	428
F-15QT	200	82	154	158
F-15SQT	103	53	2	2
F-15ST	3645	2411	332	368
F-16QT	203	85	235	238
F-16SQT	97	47	2	2
F-16ST	3769	2475	488	552
GG	133	92	437	892

RUN 2

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	126.73	62.78	128	420
AC/DB	259.63	154.5	413	875
DB	29.58	20.63	6	420
F-15QT	214.31	94.63	152	158
F-15SQT	62.94	4.35	2	2
F-15ST	3594.85	2346.85	320	368
F-16QT	219.55	105.27	235	238
F-16SQT	169.14	77.49	2	2
F-16ST	3869.59	2459.04	482	552
GG	139.98	95.52	442	901

THREE RUN STANDARD DEVIATION

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	8	7	15	18
AC/DB	43	44	21	2
DB	16	8	5	18
F-15QT	14	14	5	0
F-15SQT	72	61	0	0
F-15ST	68	72	15	0
F-16QT	14	17	3	0
F-16SQT	64	41	1	0
F-16ST	137	85	6	0
GG	10	7	8	8

RUN 3

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	125.98	48.24	157	449
AC/DB	338.89	237.99	432	872
DB	57.69	35.24	16	449
F-15QT	185.45	66.42	159	158
F-15SQT	186.03	122.1	2	2
F-15ST	3722.27	2489.09	328	368
F-16QT	198.18	75.77	237	238
F-16SQT	48.71	0	1	2
F-16ST	3824.31	2566.09	494	552
GG	136.49	97.41	441	886

		Average Flowdays	Monthly Prod
F-15	Run #1	108	42
	Run #2	104	40
	Run #3	107	41
	Average	106	41
	St Dev	2	1
F-16	Run #1	104	60
	Run #2	111	60
	Run #3	110	61
	Average	109	60
	St Dev	4	1
F-15 & F-16	Run #1	106	102
	Run #2	108	99
	Run #3	109	102
	Average	108	101
	St Dev	2	1

081062

EXPERIMENT 9

RUN 1

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	113.23	42.56	115	364
AC/DB	190.23	128.09	360	776
DB	34.93	18.17	15	364
F-15QT	1424	607.24	125	158
F-15SQT	985.2	646.64	2	2
F-15ST	4500.69	2170.13	253	368
F-16QT	1428.45	653.03	200	238
F-16SQT	1184.34	745.8	2	2
F-16ST	4859.01	2328.63	380	552
GG	116.82	98.77	411	779

THREE RUN AVERAGE

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	103	43	130	385
AC/DB	177	110	382	786
DB	37	22	12	385
F-15QT	1233	625	122	158
F-15SQT	748	363	2	2
F-15ST	4385	2235	247	368
F-16QT	1238	657	192	238
F-16SQT	676	249	1	2
F-16ST	4613	2377	386	552
GG	103	76	405	789

RUN 2

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	98.04	42.97	136	393
AC/DB	148.1	92.69	394	795
DB	33.74	21.37	11	393
F-15QT	1134.8	683.23	115	158
F-15SQT	332.86	51.48	2	2
F-15ST	4217.93	2178.01	237	368
F-16QT	1119.56	677.46	188	238
F-16SQT	440.78	0	1	2
F-16ST	4347.7	2328.33	385	552
GG	84.68	59.9	411	798

THREE RUN STANDARD DEVIATION

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	9	0	13	18
AC/DB	25	18	19	10
DB	4	4	2	18
F-15QT	166	52	6	0
F-15SQT	361	299	0	0
F-15ST	148	106	9	0
F-16QT	167	18	7	0
F-16SQT	441	431	1	0
F-16ST	256	85	6	0
GG	17	21	10	10

RUN 3

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	97.08	42.98	139	397
AC/DB	191.49	109.16	393	788
DB	41.42	25.91	11	397
F-15QT	1139.6	583.1	125	158
F-15SQT	926.8	390.29	2	2
F-15ST	4435.88	2358.21	251	368
F-16QT	1165.51	641.36	188	238
F-16SQT	403.17	0	1	2
F-16ST	4633.69	2475.12	392	552
GG	108.38	67.96	394	790

		Average Flowdays	Monthly Prod
F-15	Run #1	145	32
	Run #2	133	30
	Run #3	139	32
	Average	139	31
	St Dev	6	1
F-16	Run #1	153	49
	Run #2	137	48
	Run #3	146	48
	Average	145	48
	St Dev	8	0
F-15 & F-16	Run #1	150	80
	Run #2	135	77
	Run #3	143	80
Average		143	79
St Dev		7	2

081063

EXPERIMENT 10

RUN 1

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	84.49	34.98	124	439
AC/DB	106.13	61.49	441	900
DB	23.88	11.26	14	439
F-15QT	315.12	182.17	141	158
F-15SQT	86.46	96.94	2	2
F-15ST	3764.88	2591.88	353	368
F-16QT	316.84	182.25	213	238
F-16SQT	288.44	260.89	2	2
F-16ST	3861.23	2466.59	488	552
GG	56.16	34.5	453	902

THREE RUN AVERAGE

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	84	35	134	450
AC/DB	106	62	450	894
DB	23	13	16	450
F-15QT	317	227	143	158
F-15SQT	122	124	2	2
F-15ST	3626	2440	327	368
F-16QT	315	230	219	238
F-16SQT	212	204	2	2
F-16ST	3785	2426	494	552
GG	59	41	460	894

RUN 2

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	83.82	35.53	149	448
AC/DB	111.31	66.09	446	895
DB	21.52	11.25	15	448
F-15QT	353.59	273.5	145	158
F-15SQT	200.91	199.54	3	2
F-15ST	3722.13	2303.45	320	368
F-16QT	316.86	256.12	222	238
F-16SQT	296.75	350.61	2	2
F-16ST	3689.38	2400.67	494	552
GG	61.23	48.07	470	894

THREE RUN STANDARD DEVIATION

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	0	0	13	12
AC/DB	5	4	12	6
DB	1	3	3	12
F-15QT	36	46	2	0
F-15SQT	69	66	1	0
F-15ST	205	145	23	0
F-16QT	3	41	5	0
F-16SQT	140	182	1	0
F-16ST	88	35	6	0
GG	3	7	9	8

RUN 3

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	83.73	34.6	130	463
AC/DB	100.38	57.42	463	888
DB	23.2	15.9	20	463
F-15QT	282.28	226.1	144	158
F-15SQT	78.47	75.45	2	2
F-15ST	3390.78	2424.24	309	368
F-16QT	310.79	251.69	222	238
F-16SQT	50.67	0	1	2
F-16ST	3804.62	2411.72	499	552
GG	58.17	40.89	457	886

		Average Flowdays	Monthly Prod
F-15	Run #1	115	41
	Run #2	111	39
	Run #3	100	38
	Average	109	39
	St Dev	8	2
F-16	Run #1	116	59
	Run #2	110	60
	Run #3	114	60
	Average	113	60
	St Dev	3	1
F-15 & F-16	Run #1	116	100
	Run #2	110	99
	Run #3	108	98
Average		111	99
St Dev		4	1

081064

EXPERIMENT 11

RUN 1

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	86.1	39.48	129	429
AC/DB	102.71	61.49	433	842
DB	26.22	11.45	16	429
F-15QT	132.65	65.13	152	158
F-15SQT	69.26	18.96	2	2
F-15ST	3531.98	2482.88	333	368
F-16QT	129.54	56.21	235	238
F-16SQT	60.62	5.97	2	2
F-16ST	3366.48	2364.92	508	552
GG	54.39	37.48	401	841

THREE RUN AVERAGE

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	85	37	146	452
AC/DB	105	66	453	890
DB	28	13	12	452
F-15QT	157	73	155	158
F-15SQT	80	31	2	2
F-15ST	3520	2488	344	368
F-16QT	161	78	239	238
F-16SQT	63	12	2	2
F-16ST	3476	2408	519	552
GG	55	36	431	891

RUN 2

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	82.14	36.16	167	462
AC/DB	105.43	65.09	458	913
DB	26.66	14.6	10	462
F-15QT	173.12	80.68	154	158
F-15SQT	97.28	32.55	2	2
F-15ST	3460.37	2396.26	354	368
F-16QT	183.48	88.79	243	238
F-16SQT	53.05	30.6	2	2
F-16ST	3631.76	2447.56	522	552
GG	54.73	33.25	421	918

THREE RUN STANDARD DEVIATION

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	2	2	19	20
AC/DB	3	5	18	42
DB	3	2	4	20
F-15QT	22	8	4	0
F-15SQT	15	12	0	0
F-15ST	55	94	11	0
F-16QT	28	19	4	0
F-16SQT	11	16	1	0
F-16ST	139	41	9	0
GG	1	3	37	43

RUN 3

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	86.3	36.85	141	466
AC/DB	107.79	71.78	467	915
DB	31.23	13.55	9	466
F-15QT	166.46	73.93	159	158
F-15SQT	73.38	42.53	2	2
F-15ST	3567.39	2584.39	346	368
F-16QT	170.37	88.77	239	238
F-16SQT	73.9	0	1	2
F-16ST	3429.67	2412.01	526	552
GG	56.44	38.58	472	914

		Average Flowdays	Monthly Prod
F-15	Run #1	102	41
	Run #2	102	43
	Run #3	104	42
	Average	103	42
	St Dev	1	1
F-16	Run #1	97	62
	Run #2	105	64
	Run #3	100	64
	Average	101	63
	St Dev	4	1
F-15 & F-16	Run #1	99	103
	Run #2	104	106
	Run #3	102	106
Average		102	105
St Dev		2	2

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EXPERIMENT 12

RUN 1

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	102.16	39.93	118	417
AC/DB	148.14	84.03	422	825
DB	30.18	37.49	15	417
F-15QT	459.49	312.94	150	158
F-15SQT	323.32	192.73	2	2
F-15ST	3810.26	2383.06	320	368
F-16QT	451.37	290.06	225	238
F-16SQT	260.85	198.03	2	2
F-16ST	3737.58	2325.34	464	552
GG	87.07	60.96	409	831

THREE RUN AVERAGE

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	103	45	120	417
AC/DB	147	83	419	841
DB	39	39	12	417
F-15QT	491	381	143	158
F-15SQT	338	212	2	2
F-15ST	3909	2450	312	368
F-16QT	485	372	214	238
F-16SQT	115	66	1	2
F-16ST	3791	2330	458	552
GG	86	57	411	845

RUN 2

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	107.47	53.52	116	421
AC/DB	146.84	83.13	424	839
DB	33.25	28.97	16	421
F-15QT	504.01	376.31	143	158
F-15SQT	334.88	143.33	3	2
F-15ST	3818.99	2433.34	313	368
F-16QT	490.8	352.2	216	238
F-16SQT	27.31	0	1	2
F-16ST	3853.08	2308.73	459	552
GG	81.35	51.05	421	841

THREE RUN STANDARD DEVIATION

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	4	7	5	5
AC/DB	1	1	8	18
DB	13	11	6	5
F-15QT	27	70	8	0
F-15SQT	17	80	1	0
F-15ST	164	76	9	0
F-16QT	31	93	13	0
F-16SQT	127	114	1	0
F-16ST	58	23	7	0
GG	5	5	9	16

RUN 3

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	98.75	42.11	126	412
AC/DB	146.27	82.41	410	860
DB	54.45	50.53	6	412
F-15QT	508.18	453.07	135	158
F-15SQT	356.09	299.89	2	2
F-15ST	4097.79	2533.08	302	368
F-16QT	512.7	472.92	200	238
F-16SQT	55.56	0	1	2
F-16ST	3782.93	2355.03	450	552
GG	90.79	57.94	403	862

		Average Flowdays	Monthly Prod
F-15	Run #1	114	39
	Run #2	115	38
	Run #3	124	37
	Average	118	38
	St Dev	6	1
F-16	Run #1	111	58
	Run #2	116	56
	Run #3	116	54
	Average	114	56
	St Dev	3	2
F-15 & F-16	Run #1	112	97
	Run #2	115	95
	Run #3	119	91
Average		115	94
St Dev		3	3

081066

EXPERIMENT 13

RUN 1

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	85.64	36.58	138	467
AC/DB	113.13	73.72	464	902
DB	25.83	13.63	13	467
F-15QT	142.34	65.66	150	158
F-15SQT	33.67	0.54	2	2
F-15ST	3660.44	2648.33	341	368
F-16QT	142.51	59.75	231	238
F-16SQT	93.13	15	2	2
F-16ST	3581.8	2481.92	539	552
GG	61.12	41.37	443	902

THREE RUN AVERAGE

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	84	35	135	448
AC/DB	109	69	449	904
DB	23	14	14	448
F-15QT	143	66	154	158
F-15SQT	51	19	2	2
F-15ST	3531	2403	350	368
F-16QT	142	64	237	238
F-16SQT	71	41	2	2
F-16ST	3494	2448	525	552
GG	59	41	454	905

RUN 2

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	82.03	35.39	145	447
AC/DB	111.26	74.01	450	912
DB	22.69	12.8	10	447
F-15QT	131.17	58.2	155	158
F-15SQT	49.69	19.89	2	2
F-15ST	3562.48	2339.36	363	368
F-16QT	139.12	65.51	242	238
F-16SQT	101.4	107.13	2	2
F-16ST	3456.18	2433.84	522	552
GG	65.34	46.04	472	915

THREE RUN STANDARD DEVIATION

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	2	2	11	18
AC/DB	6	8	16	8
DB	2	2	5	18
F-15QT	12	7	3	0
F-15SQT	18	19	0	0
F-15ST	148	220	11	0
F-16QT	3	4	6	0
F-16SQT	45	58	1	0
F-16ST	76	30	13	0
GG	7	6	16	9

RUN 3

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	84.2	32.37	123	431
AC/DB	101.66	60.3	432	897
DB	21.26	16.46	19	431
F-15QT	154.59	72.92	156	158
F-15SQT	70.09	37.75	2	2
F-15ST	3370.18	2221.75	347	368
F-16QT	145.51	67.24	239	238
F-16SQT	19.14	0	1	2
F-16ST	3443.38	2427.09	513	552
GG	51.63	34.59	448	897

		Average Flowdays	Monthly Prod
F-15	Run #1	107	41
	Run #2	105	43
	Run #3	98	42
	Average	104	42
	St Dev	5	1
F-16	Run #1	106	64
	Run #2	100	64
	Run #3	100	63
	Average	102	64
	St Dev	4	1
F-15 & F-16	Run #1	106	105
	Run #2	102	107
	Run #3	99	105
Average		103	106
St Dev		4	1

EXPERIMENT 14

RUN 1

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	103.25	44.82	137	436
AC/DB	214.01	139	432	867
DB	33.35	28.38	11	436
F-15QT	287.11	158.84	144	158
F-15SQT	76.34	72.93	2	2
F-15ST	3697.45	2531.73	343	368
F-16QT	298.25	170	215	238
F-16SQT	145.91	58.09	2	2
F-16ST	3641.96	2307.05	475	552
GG	153.68	118.98	425	866

THREE RUN AVERAGE

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	100	44	133	443
AC/DB	209	124	439	868
DB	33	22	11	443
F-15QT	317	203	143	158
F-15SQT	180	102	2	2
F-15ST	3676	2469	329	368
F-16QT	332	218	218	238
F-16SQT	200	173	2	2
F-16ST	3743	2379	477	552
GG	149	104	414	870

THREE RUN STANDARD DEVIATION

RUN 2

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	95.07	45.32	121	438
AC/DB	207.87	122.33	432	872
DB	37.45	24.71	15	438
F-15QT	346.27	220	141	158
F-15SQT	249.45	136.09	2	2
F-15ST	3731.59	2496.69	314	368
F-16QT	337.82	220.42	221	238
F-16SQT	414.2	459.57	2	2
F-16ST	3688.54	2332.38	476	552
GG	141.99	91.89	410	872

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	5	2	10	11
AC/DB	5	14	12	3
DB	5	7	4	11
F-15QT	30	38	2	0
F-15SQT	91	32	0	0
F-15ST	69	81	15	0
F-16QT	32	47	3	0
F-16SQT	193	250	1	0
F-16ST	136	104	3	0
GG	6	14	10	4

RUN 3

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	102.69	42.24	140	456
AC/DB	203.64	112.14	452	866
DB	26.91	14	7	456
F-15QT	318.18	228.93	144	158
F-15SQT	214.28	97.97	2	2
F-15ST	3598.2	2377.81	330	368
F-16QT	361.19	263.49	218	238
F-16SQT	39.96	0	1	2
F-16ST	3897.61	2498.94	480	552
GG	152.32	100.76	406	873

		Average Flowdays	Monthly Prod
F-15	Run #1	112	41
	Run #2	111	38
	Run #3	108	40
	Average	110	40
	St Dev	2	1
F-16	Run #1	108	58
	Run #2	109	58
	Run #3	116	58
	Average	111	58
	St Dev	4	0
F-15 & F-16	Run #1	110	98
	Run #2	110	96
	Run #3	113	98
Average		111	98
St Dev		2	1

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EXPERIMENT 15

RUN 1

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	103.43	45.85	137	461
AC/DB	178.52	120.05	447	911
DB	29.93	22.22	14	461
F-15QT	183.57	93.38	154	158
F-15SQT	62.93	29.29	2	2
F-15ST	3722.58	2438.98	353	368
F-16QT	190.19	102.28	236	238
F-16SQT	141.6	54	2	2
F-16ST	3792.13	2503.73	525	552
GG	127.88	87.75	475	923

THREE RUN AVERAGE

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	104	47	137	449
AC/DB	170	116	440	889
DB	30	23	14	449
F-15QT	206	111	154	158
F-15SQT	78	39	2	2
F-15ST	3724	2462	344	368
F-16QT	214	113	236	238
F-16SQT	79	28	2	2
F-16ST	3641	2421	514	552
GG	110	82	460	898

RUN 2

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	107.77	47.52	136	429
AC/DB	169.6	125.13	419	873
DB	34.34	26.91	13	429
F-15QT	180.72	79.9	155	158
F-15SQT	94.65	46.28	3	2
F-15ST	3761.01	2408.08	341	368
F-16QT	184.71	82.04	243	238
F-16SQT	45.6	31.07	2	2
F-16ST	3492.69	2408.27	507	552
GG	105.51	96.69	439	881

THREE RUN STANDARD DEVIATION

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	3	1	2	17
AC/DB	8	11	18	20
DB	5	3	1	17
F-15QT	41	42	2	0
F-15SQT	16	9	1	0
F-15ST	37	68	8	0
F-16QT	46	38	7	0
F-16SQT	54	27	1	0
F-16ST	150	77	9	0
GG	16	19	19	22

RUN 3

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	101.6	46.67	139	457
AC/DB	162.11	103.98	453	884
DB	24.44	21.27	14	457
F-15QT	253.34	159.12	152	158
F-15SQT	77.36	40.91	2	2
F-15ST	3687.12	2539	337	368
F-16QT	266.43	156.05	230	238
F-16SQT	51.23	0	1	2
F-16ST	3639.25	2351.62	511	552
GG	98.05	60.71	467	891

		Average Flowdays	Monthly Prod
F-15	Run #1	110	42
	Run #2	109	42
	Run #3	109	41
	Average	109	42
	St Dev	1	1
F-16	Run #1	111	64
	Run #2	101	63
	Run #3	108	62
	Average	107	63
	St Dev	5	1
F-15 & F-16	Run #1	111	106
	Run #2	104	104
	Run #3	108	103
Average		108	104
St Dev		3	2

081069

EXPERIMENT 16

RUN 1

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	83.35	34.9	156	449
AC/DB	107.67	61.44	452	894
DB	24.35	16.42	7	449
F-15QT	118.15	49.71	154	158
F-15SQT	81.81	77.36	2	2
F-15ST	3524.32	2527.18	356	368
F-16QT	129.5	54.68	234	238
F-16SQT	61.59	4.75	2	2
F-16ST	3531.45	2491.97	525	552
GG	55.7	38.47	445	896

THREE RUN AVERAGE

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	89	38	152	456
AC/DB	108	64	453	902
DB	26	16	13	456
F-15QT	126	56	158	158
F-15SQT	63	26	2	2
F-15ST	3377	2394	345	368
F-16QT	133	58	240	238
F-16SQT	61	14	2	2
F-16ST	3493	2431	535	552
GG	54	36	437	905

RUN 2

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	93.58	38.65	157	471
AC/DB	107.7	64.87	469	906
DB	28.5	15.5	13	471
F-15QT	121.19	54.46	157	158
F-15SQT	57.77	1.44	2	2
F-15ST	3352.7	2354.39	340	368
F-16QT	131.03	54.05	242	238
F-16SQT	82.47	20.97	2	2
F-16ST	3406.3	2325.25	533	552
GG	54.63	34.88	436	907

THREE RUN STANDARD DEVIATION

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	5	2	7	13
AC/DB	0	2	15	7
DB	2	1	6	13
F-15QT	11	7	4	0
F-15SQT	17	44	0	0
F-15ST	137	119	10	0
F-16QT	4	7	5	0
F-16SQT	22	8	0	0
F-16ST	76	92	11	0
GG	2	2	8	8

RUN 3

PN	FLOW TIME	ST DEV	NUMOUT	NUMIN
AC	90.13	39.22	144	448
AC/DB	108.35	65.43	439	907
DB	25.57	14.64	18	448
F-15QT	138.59	62.85	162	158
F-15SQT	48.08	0.4	2	2
F-15ST	3252.67	2299.88	339	368
F-16QT	137.69	66.1	244	238
F-16SQT	38.39	16.95	2	2
F-16ST	3542.44	2476.92	546	552
GG	52.68	34.98	430	912

		Average Flowdays	Monthly Prod
F-15	Run #1	104	43
	Run #2	97	42
	Run #3	93	42
	Average	98	42
	St Dev	5	1
F-16	Run #1	103	63
	Run #2	99	65
	Run #3	104	66
	Average	102	65
	St Dev	2	1
F-15 & F-16	Run #1	103	106
	Run #2	98	106
	Run #3	100	108
Average		100	107
St Dev		3	1

081070

9.0

POTENTIAL IMPROVEMENT RECOMMENDATIONS

The civilian industry has a low spare rate of major units. The goal for the major maintenance bases is to keep the units in the field - working. This is accomplished in two ways:

- 1) Make sure the units are **ACTUALLY REPAIRED SO THAT THE RETURN RATE IS LOW AND THAT THE TIME COMPLIANCE REQUIREMENTS UNTIL THE NEXT TEARDOWN ARE HIGH;**
- 2) Move the units through the shop **AS FAST AS POSSIBLE.**

A problem that the civilian industry deals with regularly is **LACK OF MONEY** to spend on maintenance...the goal being **TO DO THE BEST POSSIBLE JOB AND STILL SAVE MONEY. THE WAY TO REACH THIS GOAL IS TO WORK EFFICIENTLY AND COST-EFFECTIVELY.**

THE MILITARY IS NOW BEING FACED WITH BUDGET CRUNCHES, WHICH WILL ONLY GET WORSE AS THE YEARS GO ON.

The age-old system, which includes deep pockets and loose accountability standards, will not work anymore. **THERE IS A NEED TO CHANGE THE PROCESS and, in some cases, THE BASIC WAY OF THINKING.** The budget of the future will create a necessity to be more efficient and to keep spares in the field...rather than having to buy new UFCs "as an emergency."

Specifically, it is necessary to have an accurate plan for each repair shop to follow. Technical data must reflect daily operations according to military rules and regulations. There is no way the UFC shop should be operating with tech data that has little, if anything, to do with the way they are actually doing business. There is, indeed, a major difference between on-condition maintenance and complete overhaul or even "return to specifications."

The civilian industry must report to the FAA, so (by law) airlines and third-party maintenance organizations have clear-cut regulations to follow. These maintenance documents are blessed by the FAA, and are also the documents to which their actual practices are compared during inspections.

In order to make sure that shops are adhering to the established technical data (this is assuming that correct tech data **WILL** be written), there must also be random inspections done at various points in the process **BY SOMEONE OUTSIDE THE SHOP'S CHAIN OF COMMAND.**

090001

Individual parts *must* be tracked all the way through the process. This should include notating what was done to the part. **BAR CODING**, as part of a computerized tracking system, IS AN EASY WAY TO IMPLEMENT SUCH A PROCESS.

Having this kind of indepth history available will also make it easier to do the research necessary to solve the quality problem. According to records, the amount of time in the field between depot-level maintenance visits is about 1/3 of Bendix's predictions: 600 hours instead of 1800! Some of this deviation may be due to optimistic expectations on the part of Bendix; however, those kind of statistics would not be tolerated in the civilian industry.

A study needs to be done together with the vendor. New procedures should be written to detail how the process actually works, and then realistic statistics for the units should be calculated. Given the current data, it would seem that time-compliance tasks should be adjusted to accommodate the high failure rate in the field.

The absence of applicable tech data more than likely has a direct relation to the high number of UFCs coming back with failures so soon after repair. This problem goes deeper than "HIGH INFANT MORTALITY RATES." This also suggests that there is not enough separation between Q.C. personnel and the Production Department.

CLEARLY, IT IS IMPOSSIBLE TO PINPOINT PROBLEMS IN THE PROCESS OF A SHOP (OR THE QUALITY OF WORK PUT OUT) IF THERE IS NOT A PARTS ACCOUNTIBILITY PROGRAM, NOR A SERIOUS QUALITY CONTROL PLAN.

On-Condition Maintenance (OCM) programs have been established by many of the airlines - and then abolished. One of the reasons for this is that units were not able to remain in the field as long before being brought in for another problem or a time-compliance inspection. OCM works much better in the airframe department than in the engine department.

Actually, an OCM program might work efficiently for the Air Force because of the huge inventory of spares...if it is possible to get the majority of the inventory out in the field, working. I do not have exact numbers, but I do know that the USAF's inventory (spare level) is substantially higher than the civilian industry's. On the other hand, the percentage of that inventory that is ACTUALLY FUNCTIONING IN THE FIELD IS WAY TOO LOW.

090002

FOR THE PRICE OF ALL THESE REPAIRABLE ASSETS, THE AIR FORCE COULD BUY _____! (Pick something that everyone can relate to longingly) X # of BMWs?

The current OCM team is moving in the right direction towards creating a functional data base for the UFCs. It is still impossible to have an accurate history of each UFC if there is only information regarding the *type* of previous write-up, but with no data about what was done to repair said item.

Plans & Scheduling should start the process on each UFC to be inducted by checking its history before it is released by DS. But, how can Production be prepared to handle recurring problems if there are no systems in place to actually "track incoming repairable assets by serial number?" (Nadeau, Jul 90)

In the civilian industry, the Planning Department takes an active role in accountability, parts tracking and workflow. Call it what you will, there is no tolerance for working "easier" jobs first or putting off particular jobs because of "parts availability." Workflow is established in planning; deviations must be explained by floor managers.

In the Plans & Scheduling Departments of civilian companies, there is limited technical training, but these personnel **CAN, AND DO,** differentiate between various components and parts. This is learned by studying pictures of units shown torn down, as well as from spending time out on the floor tracking part numbers during required "random checks."

Procurement of necessary parts to keep units flowing through in a timely manner should be a priority. Inventory should not be "frozen" unless it is an absolute emergency; most companies had never heard of that happening - ever! When parts availability becomes a problem, yet the parts are actually in the hands of the company (in this case, the Air Force's distribution center, "DS".) the system needs to be changed.

090003

I also suspect there may be some problem in the way that "pending parts waiting" items are handled by MIC. Because a desk drawer is used as a pending file, it is possible that suspense items are not checked on for a "re-request" often enough. (One has a tendency not to flip through lots of little pieces of paper on a daily basis when other work takes the attention.) Since the Air Force has computer capability, it would be a good idea to transfer the suspense or pending files to a computer program - perhaps the Tracker II program could accommodate this.

Once new procedures documentation is written, there is another area which will become easier to manage: Training of new personnel.

For the airlines and 3rd-party companies, the FAA requires complete training records be kept on each mechanic. This has prompted these civilian organizations to develop detailed training programs over the years. A single mentor (or the last person to fill that slot) does not have to be attached to the new employee because the supervisor can assign different people to train and sign-off each task.

There are many ways to increase productivity and quality. But in order for these new ideas to take hold, upper management must make the changes. Decisions will have to be made to try the experimentation necessary to pinpoint the big problems in the system. Parts accountability and the creation of an accurate manual for current maintenance practices are the two places to begin solving the problems.

Being accountable, by having procedures and tracking methods, will undoubtedly make some people within the system very nervous. Such a system will show quite quickly where flaws in the process are hidden.

Unfortunately, if the low spare rate in the field is ever to be brought up to an acceptable amount, and the quality of those spares is to be increased, an accountability method will have to be established.

Question: How can one be sure that increased production rates and lowered flowtime and WIP levels are not due to a large # of units that had been WIP for months which finally came through during this period of time?

090004

9.1

SPARES INVENTORY

ENGINEERING NOTES

269

1

EMPLOYEE MAJOROSDATE 14 Sept 90PAGE NO. 1RCC MATPFASUBJECT Human Factors RecommendationADDITIONAL NOTES REGARDING HUMAN FACTORS EVALUATION
OF SAN ANTONIO UFC TEST AND REPAIR FACILITY, KELLY AFBA. Majoros, S. Heinze, P. Neander, Douglas Aircraft Co.
September 18, 1990

Observations

Physical condition

Test Stand Operation. Accessibility of tools is good since operators have tool boxes close at hand. Some tool boxes were observed containing tool pockets out into foam to insure that tools could be quickly accessed and not lost. Attachment of lines to plumbing hook-up points is time-consuming due to the nature of fuel controls (attachment can take up to three hours); this operation could be assigned to a lower skill trainee to better use skilled operators' time. Improved labeling of test stand hook-up lines may also help to reduce the time for this task. Test stands appear well designed, although frequent checking of computer screen (on the larger stands) while making adjustments on controls may be fatiguing.

Space between stands, cushioned mats on floor, and bench-top space appear adequate. Shop is clean and not unusually noisy.

Operators' aprons and goggles are adequate, and do not appear to inhibit movement. Sliding spray screens near controls can be positioned to protect operators from high-pressure spray. Emergency stop switches are well placed and labeled. In general, responsible safety concerns are evident.

Regarding lighting, work on controls seems to require higher levels, but the screens on test stands seem to require lower levels. No measurements were taken, but we recommend them. If lighting in the shop is increased, add shrouds over the computer screens.

Fuel Control Repair. Tools are readily accessible since tool boxes are located next to work benches.

DDB SECTION CODE _____ DDB PAGE NO. _____
The repair area is spacious, although an observer might have the impression that individual craftsmen do not have adequate benchtop

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ENGINEERING NOTES

EMPLOYEE _____ DATE _____ PAGE NO. 4 ²⁷²
RCC _____ SUBJECT _____

These factors were not studied. However, it appears to us that changes to improve efficiency and throughput would be easier to accomplish in areas other than shifts, breaks, and work schedules.

Processes

Many observations about processes with the UFC facility are contained in our Engineering Notes of July 20 and August 15, 1990. We believe that processes offer a great potential for improvement especially if these are in association with personnel (e.g., training, allocation of skills) and equipment (e.g., improved scheduled maintenance on test stands) solutions. The Engineering Notes contain a number of suggestions.

The process-related matter that seems to stand out most clearly is the variability in method among operators. (Variability of method probably occurs among craftsmen as well, but our focus was the test environment). Examples of this variability include, but are probably not limited to, time to "plumb" a control for testing, number of repetitions of tests, amount of time on some tests, interpretation of test data, interpretation of test stand and fuel control interactions, and selection of procedural information to follow. Variability should be avoided where possible because it makes the process difficult to understand and therefore difficult to improve, it affects quality, it makes production levels difficult to predict, and it creates unexpected performance differences among people.

Recommendation for Further Study or InterventionBrief Description

The variability matter discussed in Processes above is an excellent target for further study because low-cost changes in information presentation have a good chance of reducing variability. An intervention approach applying to test stand operators that could address the variability matter described above would standardize the information available to operators.

Briefly, this idea calls for a computerized data base containing diagnostic and adjustment (corrective information) information.

091662

EMPLOYEE _____

DATE _____

PAGE NO. 2

2

RCC _____

SUBJECT _____

space for their tasks. There was no close observation regarding this need. Repair people have mats on which to stand, stools for sitting, bench-top surfaces, parts trays, and a clean and orderly work environment. We did not study these features closely; craftsmen may have a number of "likes" and "dislikes" about these items and production may or may not be affected by them.

Area lighting seems to be adequate, but task lighting does not (again though, no measurement).

Test Stand Repair (On-Site Maintenance). Personnel come into the test and repair facility to maintain test stands. The larger stands are well designed for repair and maintenance access, although particular problems may be present of which we are unaware. We did not observe access provisions on small stands.

Work inside stands may be difficult and uncomfortable, especially for tall persons. The floor surface is steel grate, task lighting must be brought in, and pumps (for those times when pumps must be running while on-site maintenance is inside the stand) probably create high noise levels.

Access around and between stands is cramped and it seems that moving tools, components and support items (lights, hoists, etc.) would be difficult. Long repair times on test stands creates a snowballing problem: controls might be moved to another test stand, long "negotiations" regarding test stand versus control diagnosis may occur, and predictability of production is reduced.

The layout of stands is understandably oriented to use of the stands rather than repair of the stands, but because test stands require considerable scheduled and unscheduled maintenance, efforts to reduce the frequency of test stand repair should be aggressively investigated.

Morale, Supervision, and Management

We made no formal study of these factors, but discussion with several facility personnel and with MDC on-site personnel gave us some observations. ~~Test and repair facility personnel~~ Test and repair facility personnel enjoy good morale. No suggestion of apathy was encountered. There is a shared perception that the work of the facility requires extensive training.

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ENGINEERING NOTES

EMPLOYEE _____

DATE _____

PAGE NO. _____

P14 271

3

RCC _____

SUBJECT _____

skill, perseverance, and intelligence. Personnel are aware of the importance of their production to Air force readiness and have been recognized with several awards. The facility is the subject of attention and personnel generally believe their problems can be solved.

Some personnel at various ranks and levels may have come to believe that all aspects of test and repair require high skill levels and that their field (i.e., unified fuel controls) is so complex that standardized procedures are not useful. We believe that supervisors and managers should be aware of this thinking and try to modify it throughout the facility to this end; not all aspects of test and repair require high skill levels (so it is good to allocate skill where it does the most good for production) and standardization is especially useful with complex equipment.

Supervision has a challenging, dual task: (1) encouraging independent thinking among test and repair personnel and, at the same time, (2) teaching their people to seek expert help and accept management goals for the facility. Our impression is that the supervisors in the facility are required to devote too much attention to threading through these matters and do not have enough time and attention for increasing and improving the quality of technical information available to operators and craftsmen.

Management has helped to raise morale even while keeping up a steady pressure for increased production. However, misperceptions about levels of production and quality circulate through the facility, suggesting that management could gain more cohesiveness and cooperation in the shop and could represent itself more accurately to base (executive level) management if they published data with consistent, commonly understood meanings.

Training

We were not able to study training curricula, methods, or material. Research from other fields of maintenance indicates that DD8 Section 1000 can have a significant impact on production and quality.

Shifts, Breaks, Work Schedules

091004

EMPLOYEE _____ DATE _____ PAGE NO. 5
RCC _____ SUBJECT _____

5

envision a low-cost, PC-based, evolutionary build-up of troubleshooting logic trees that supply the requesting operator an aid in fault isolation. Operators would be rewarded for making useful additions to the data base.

Rationale

The following facts suggest an intervention aimed at reducing variability in methods by improving and standardizing technical information for operators.

1. A key source of information for operators during fuel control testing is test stand output (computer screen). On-site maintenance, particularly David Bippert, has developed very comprehensive and powerful diagnostic programs out of software originally designed for quality control of newly produced UFCs. But for various reasons, such as departure from the software's original purpose, it does not meet every procedural or diagnostic need and operators typically do not rely exclusively on test stand diagnostics.

2. Technical Order (TO) information (upon which test stand diagnostics and output is based) is a second source of information for operators. However, many paragraphs are out of date and/or inaccurate. The TO is oriented to overhaul rather than test and repair, and some necessary test procedures are not contained in the TO. Surprisingly, while textual/diagrammatic fault isolation trees are virtually an industry standard format for mechanical procedural information, we could not find any of these trees in the TO.

3. Expert advice from an on-condition maintenance (OCM) team is a third source of information. The OCM team consults on problems and distributes tips, solutions, and advisories on paper to operators. Frank Mann, before becoming OCM Team Leader, started a trial system whereby operators in his unit would write their diagnostic and adjustment procedures on sheets of paper and turn them in to him. Mann's intent was to sort through the written sequences and determine the most effective troubleshooting sequences for specific problems. Mann told us that his system was popular in his unit because it increased the amount of shared information about specific problems.

DDB SECTION CODE

DDB PAGE NO.

091005

EMPLOYEE _____ DATE _____ PAGE NO. 6
RCC _____ SUBJECT _____

6

He was promoted before collecting enough of the forms to derive optimal sequences.

4. A fourth source of information used in fault isolation is knowledge shared among operators themselves. This sharing is effective when it is available, but no formal means exist to build on it. Mann's experience indicates that operators would probably share tips, discoveries, and useful experiences more often if a medium existed to do so, particularly if some incentive (reward) were associated with the sharing.

5. Training information is a fifth source of information, although we were not able to study this material.

6. The variety of sources adds to the variability in method among operators, but the fact that information comes from multiple sources should be respected. Attempts to combine, supersede, or abolish some forms of information would be very time-consuming and counterproductive.

More on the rationale for this approach is contained in the Engineering Notes of August 15, pp 5-8.

Detailed Description of Intervention or Study Plan

This intervention calls for setting up in the shop area a single 386- or 486-level ruggedized personal computer with high-capacity hard drive. The computer would run a data base program with simple graphics to produce fault isolation trees and a simple menu for operator interface.

To use the computer, operators would walk from their stands to a central location, use a menu to select a test paragraph, and request a printed copy of a logic tree containing the test and fault isolation sequences for the paragraph. (Please see attachments for sample screens.) They would return to their stands with the printed copy.

Logic tree sequences would contain usually three alternative procedures in a suggested sequence.

- DDB SECTION CODE _____ DDB PAGE NO. _____
- o Test stand procedure is shown in standard fault-tree format (first alternative)
 - o TO procedure is also shown in standard fault-tree format (second

091066

275
8

PAGE NO. 7

SUBJECT _____

- 8

Prototype menu screens and screens with logic trees are attached (6 pages). All of these pages present models of actual screen (and NCR paper) output, although only the first two pages are shown with borders. The prototypes deal with Mating and Indexing Paragraph 12.000, Idle Governor. Subparagraphs 12.090, 12.110, 12.130, 12.140 and 12.180 are shown in prototype. Note that alternative sequences are called out, giving a choice to the operator, but leading to ~~consequences, letting operators by their own choosing order of display.~~ The alternatives (test stand instructions, TO, OCM recommended approach, etc.) should be arranged represent the facility's usual priority ()

091667

EMPLOYEE _____

DATE _____

PAGE NO. 8

RCC _____

SUBJECT _____

10

M & I Fault Solution ComputerEnter Test Sequence Paragraph
Number _____

Press Enter to Continue

*Menu Screen #1***12.000 Idle Governor**Select a specific Paragraph
Number:

- ___ 12.090
- ___ 12.110
- ___ 12.130
- ___ 12.140
- ___ 12.160
- ___ 12.180

Place an "X" on Line and Press Enter to Continue

Menu Screen #2(Optional: Will not
appear if entire
test sequence
number is entered
in Menu #1)

DDB SECTION CODE _____

DDB PAGE NO. _____

091068

091009

Exercise
UFC

A

12.083
Setup

12.085
Setup

12.086
Setup

12.090
Setup

12.095
Setup

Out of
Limits or
CNT < 3
?

NO

YES

Alternative 1

Remove PLAP turn
cam follower access
port plug from work
cover (Nturns =
1350-W090/400)

YES

NO

Adjust PLAP turn
trim cam follower.
Flat(s) CW.

Adjust PLAP turn
trim cam follower.
Flat(s) CCW.

Use 2552130 or
2552134 adapter.
Install access port
plug in work cover

A

DDB PAGE NO.

Governor bias
schedule, governor
trim, and governor
part power must be
rechecked after
adjusting PLAP trim
cam follower

A

Alternative 2

Remove PLAP turn
cam follower access
port plug from work
cover (Nturns =
1350-W090/400)

YES

NO

Adjust PLAP turn
trim cam follower.
Top F 9-68 CW inc
or F 9-66 N.

Nturns < 0?

Alternative 3

Probable fault at
TPT 12.085/12.090
is GG computer
assembly. Contact
OCM team.

DDB SECTION CODE

A

Place "X" on Line Next to Desired Option and Enter:

Next Page Previous Page Print this Page Print all Pages Return to Main Menu

EMPLOYEE _____

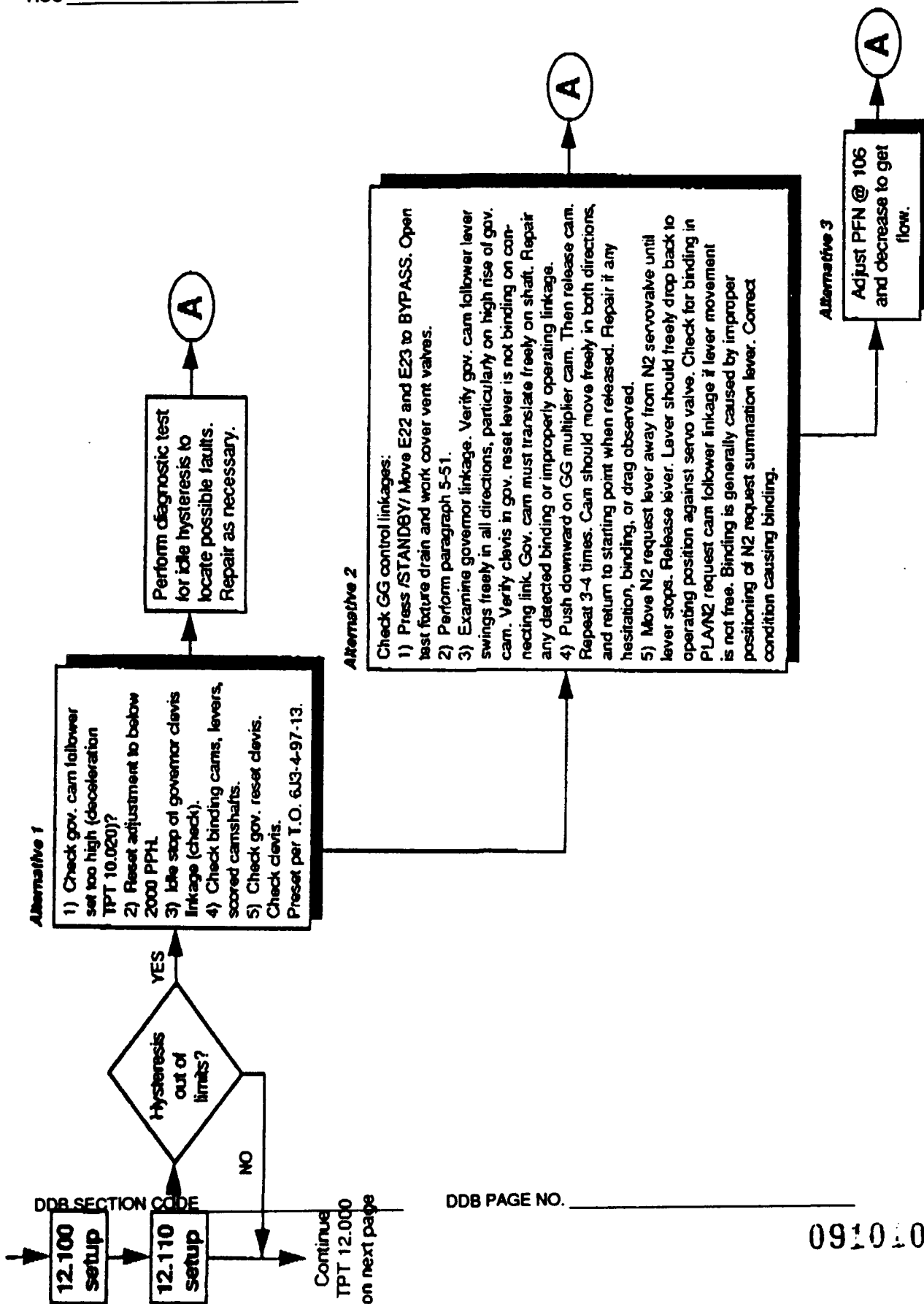
DATE _____

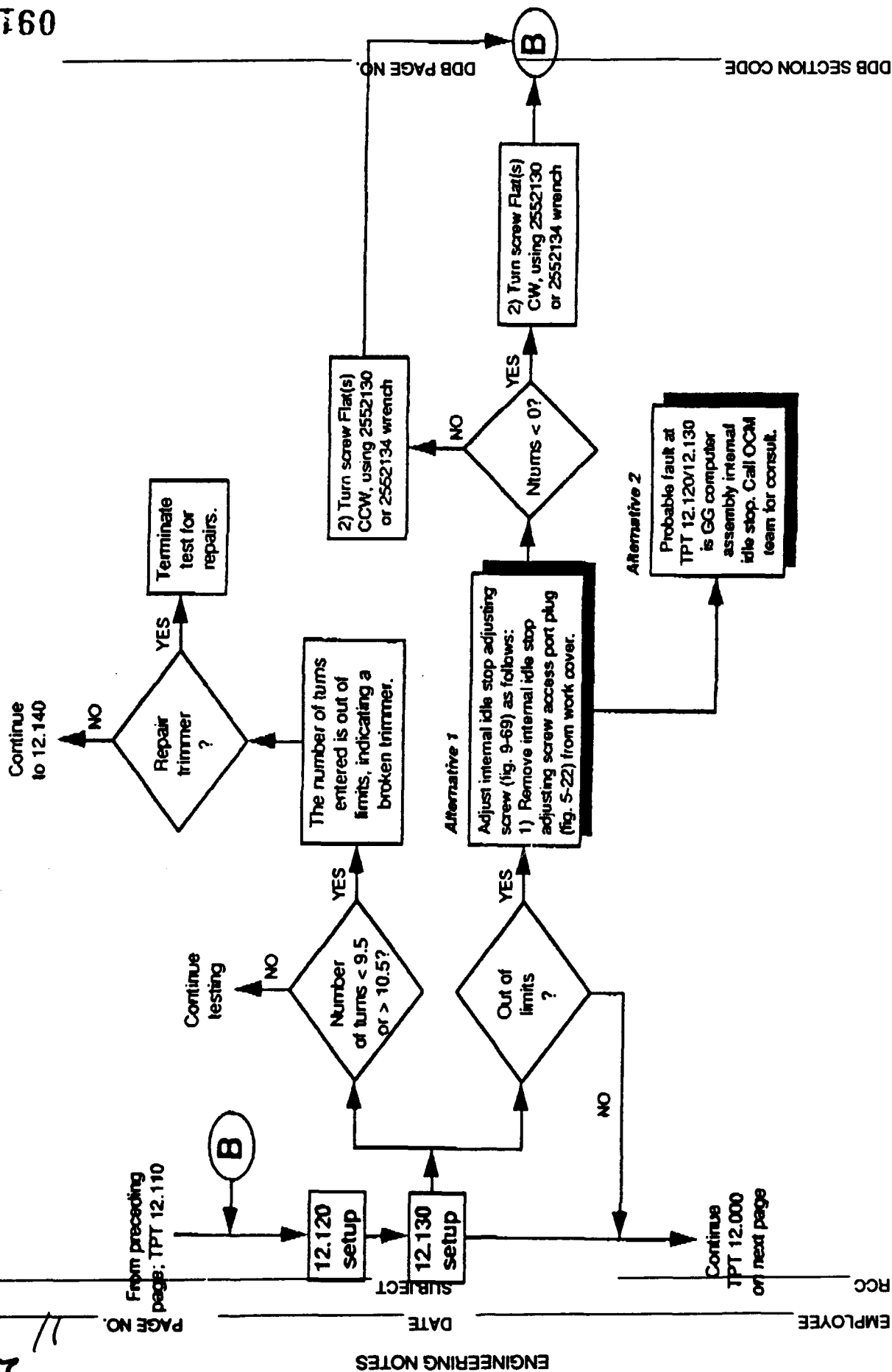
PAGE NO. 10

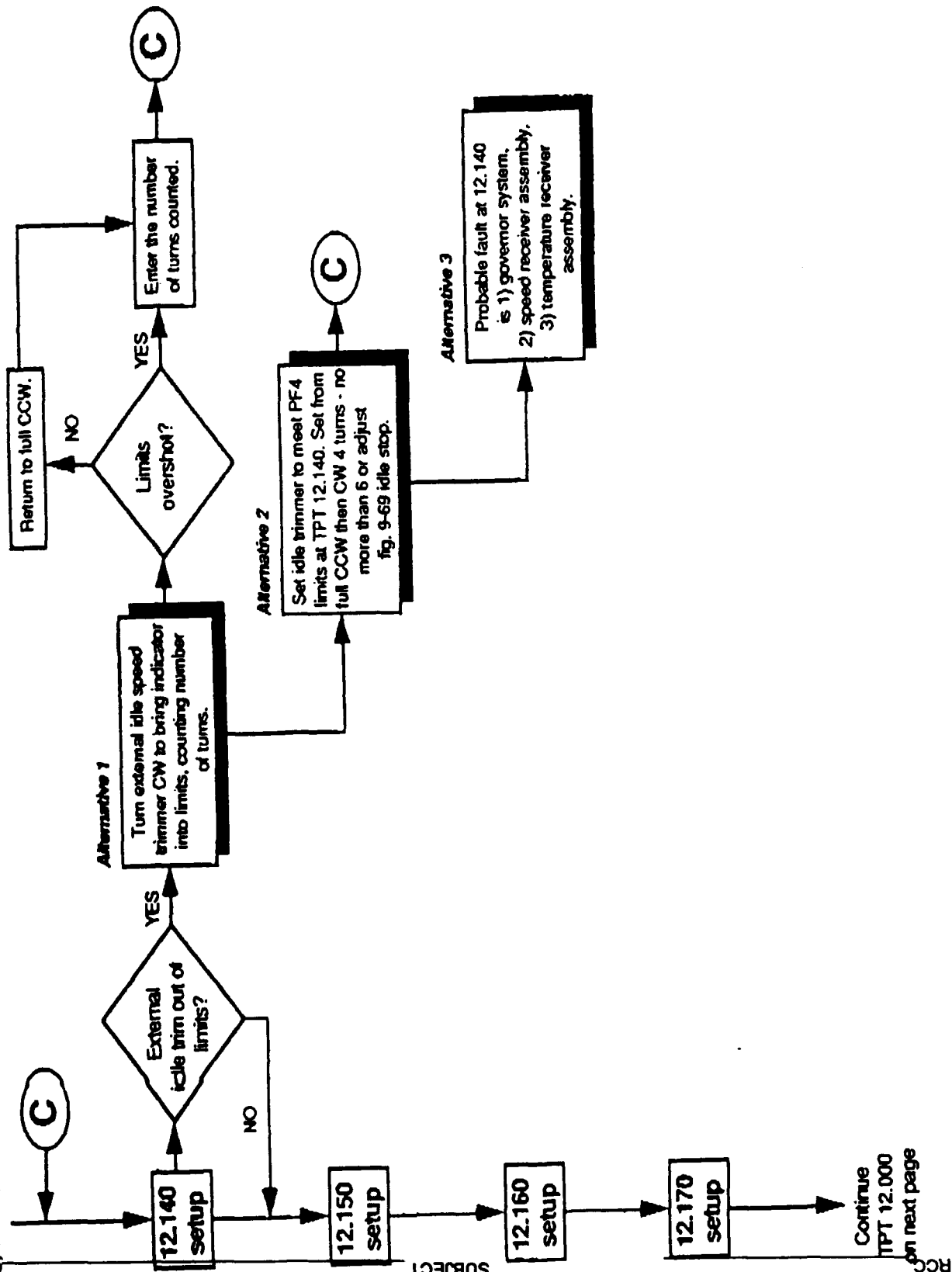
12

RCC _____

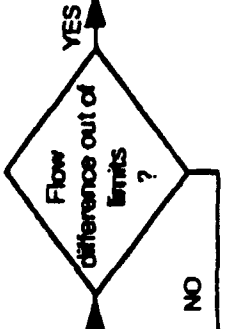
SUBJECT _____







Alternative 1
Governor reset clevis (fig. 9-80). Check preset per T.O. 6J3-4-97-13.



12-180 Setup

Alternative 2

Adjust governor reset lever clevis (fig. 9-80) as follows if WF4 difference out of limits:

- a) Press /STANDBY/ Move EEC E22 and E23 to BYPASS. Open test fixture drain and work cover vent valves.
- b) Perform paragraph 5-51.

NOTE: Use special care during following steps to avoid dropping loose parts. Removal of dropped parts from control is very difficult, and may require gas generator control removal from test fixture.

- c) Remove cotter pin, washer, and pin securing connecting link in clevis. Disengage link.
- d) Turn clevis one full turn counterclockwise (out of governor reset lever).
- e) Reposition connecting link end in clevis. Install pin, washer, and replacement cotter pin. Completely spread cotter pin legs.
- f) Perform paragraph 5-38. Readjust if out of limits. Recheck.

A

Alternative 3

TP 12.160 out 30 lbs. or less, single step and cycle PFN 80 to 110.7 to bring into limits

A

EMPLOYEE _____ DATE _____ PAGE NO. 14
RCC _____ SUBJECT _____

9

ranking for particular tests.

Implementation Plan

We suggest the following sequence for implementing this method.

1. Present idea to customers. Obtain approvals.
2. Determine requirements for computer in UFC shop.
3. Locate computer and printer and purchase.
4. Design database and graphics interface with user-friendly input and output screens as suggested by this Human Factors analysis.
5. Gather information regarding M & I test sequences (if M & I is selected as the system trial). This information will be located in test stand output, TOS, OCM team information, training information, operators' personal and shared knowledge.
6. Hire/transfer a programmer into the project.
7. Program database with information for some non-trivial number of paragraphs and input/output formats.
8. Select a few operators on each shift to be part of a pilot group to use the new system and attempt to increase other operators' awareness and acceptance of the new system.
9. Selected operators use system, employing computer as they encounter controls that defy quick diagnosis.
10. Programmer adds to database as trial period proceeds and uses notes and suggestions from operators' NCR copies.
11. Reward operators' additions to system.
12. System is expanded according to shop needs.

EMPLOYEE _____ DATE _____ PAGE NO. 15
RCC _____ SUBJECT _____

alternative)

- o Shop experience/OCM recommendation is also shown in standard fault-tree format (third alternative)

The personal computer printout would be on "no-carbon-required" (NCR) paper so that operators could write notes about the test paragraph and their actual experience with the specific test, keep their original in a notebook and, if they chose to, pass the copy (containing their hand-written notes about the paragraph) on to the OCM team.

If the OCM team considered suggestions in the notes to be important additions to the fault tree for particular test sequences, additions to the data base would be made and the operator submitting the notes would be rewarded in some way. This method would bring about the steady growth of shared information among operators.

The data base would contain all the various sources of information described above in Rationale for selected paragraphs. Existing fault isolation procedures from all current sources would be easily accessed with a powerful personal computer and presented in logic tree format.

Our analysis of the shop processes indicates that while the lack of a standardized system of information has made UFC fault diagnosis complicated, the current methods are still effective, although not efficient. All the data gathered by an operator is necessary to complete the task. The proposed method ...

- o would not change the information in any way.
- o would not alter procedures.
- o would not replace existing directives or supplant training material.
- o would not provide diagnoses. It is not an expert system.
- o would not require adding all paragraphs before implementation of the system. A few critical paragraphs can be selected to start the system, and additions and updating could continue after the system is introduced.

The data base would contain information that is available now,
DDB SECTION CODE _____ DDB PAGE NO. _____
and ...

091015

ENGINEERING NOTES

284

EMPLOYEE GARDNER DATE 18 Sept 90 PAGE NO. 1
RCC MATREA SUBJECT Maint. Man hour times

Roy Evans (MAZ) provided the following estimates for use in MAMSC QF cost estimates:

- : Time to fill fluid levels (hydraulic on calibration) on a 5000X Test Stand 15 mins
- : Time to change burst disk in a 5000X Test Stand 30 mins

ENGINEERING NOTES

285

EMPLOYEE GARDNERDATE 12 Sept 90PAGE NO. 1RCC MATPEASUBJECT UFC world-wide distribution

Spoke to Messrs Robert Richard and Armondo Valdez (mm) regarding a current status of UFCs in contract repair. They provided the following data which they told me was current as of 20 Aug 90:

	<u>IHI</u>	<u>BENDIX</u>	<u>P&W Overseas</u>
# UFCs IN House	15	78	30
Scheduled Flowtime	120 days*	150 days	60 days*
Monthly production RATE	4 UFCs	12-22 UFCs	10 UFCs

* The extreme difference between these vendors is caused by the fact that IHI uses Govt Furnished Materiel (GFM) for replacement parts while P&W uses its own inventory system.

DDB SECTION CODE

6.0

DDB PAGE NO.

091017

ENGINEERING NOTES

EMPLOYEE PANDY L. GRIFFDATE 7/30/90 - 8/3/90 PAGE NO. 1RCC WATERSUBJECT SPARE PARTS INVENTORY MODELPRODUCTION NIKES

WITH REGARD TO THE CONTINUING DEVELOPMENT OF THE SPARE PARTS INVENTORY MODEL, MOST OF THE DATA REQUIRED FOR EXECUTION OF THE MODEL HAS BEEN COMPILED WITH THE EXCEPTION OF THE SHORTAGE PENALTY COST, P.S. THE BASIC ISSUE WITH THE DETERMINATION OF THE COST IS THIS: IF A UFC IS CAUSED TO GO INTO AWP STATUS FOR A CERTAIN PERIOD OF TIME (SAY, 60 DAYS) BECAUSE A PARTICULAR SPARE PART SHORTAGE STOCKOUT OCCURRED, WHAT IS THE VALUE COST TO THE PRODUCTION SHOP AND THE FIELD FOR A UFC REMOVED IN STOCK (NON-PRODUCTIVE TIME)? I HAVE CONSULTED SEVERAL INDIVIDUALS IN MM TO ATTEMPT TO FIND OUT IF THE FIGURE IS AVAILABLE. APPARENTLY THE FIGURE HAS NEVER BEEN CALCULATED. WE CAN SPECULATE THAT THERE IS SOME "OPPORTUNITY" COST.

ASSOCIATED WITH THE AWP, A TYPE OF "CAPITAL" COST, WORK HOURS FOR LEGAL REWORKS, AND FIELD HOURS ASSOCIATED WITH MECHANICS LABOR FOR UFC SWITCHING. THERE ARE PROBABLY SEVERAL OTHER INDIRECT COSTS WHICH WOULD BE EXTREMELY DIFFICULT TO DETERMINE. HOWEVER, WHEN THE "STOCK FUND" BECOMES A COST CENTER, COSTING BECOMES OPERABLE. THE COST WILL BECOME CONTROLLING IN THE FUTURE ALONG WITH THE OTHER COSTS.

ALL OF THE VARIABLE RELATIONSHIPS AND EQUATIONS HAVE BEEN FORMULATED. THE MODEL WILL DETERMINE P (PERIOD) AND Q (REORDER QUANTITY) AND WILL BE COMPARED TO THE CURRENT VALUES UTILIZED BY MM.

PRODUCTION OPERATION TIMES

FOR OPERATION TIMES USED IN THE MODEL, THE SHOP SUPERVISOR WAS INFORMED AS TO WHAT DISTRIBUTIONS WERE BEING USED FOR SET UP AND OVERALL TIMES. THE SUPERVISOR STATED THAT THE SHOP SUPERVISOR HAD A GOOD UNDERSTANDING OF THE TIMES AND THAT THE TIMES WERE BEING USED IN THE MODEL.

DDB SECTION CODE

9.0

DDB PAGE NO.

091018

ENGINEERING NOTES

EMPLOYEE _____

DATE _____

PAGE NO. 1

RCC _____

SUBJECT _____

FOR INVENTORY MODEL EXTENDED FOR
RANDOM DEMANDVARIABLES: (REFERENCE PP. 72-74 OF GIND MANUAL)K: $K=0$ FOR OUR PURPOSES. NO SET-UP TIME EXISTS FOR THE SPARE PARTS COMPONENTS.H: THE HOLDING COST IS GIVEN AS .5% OF THE PURCHASE COST/UNIT OF THE SPARE PART. GLEN BISH, PROGRAM MANAGER OF THE FIB, INDICATED THAT THE ACTUAL STORAGE COST CALCULATION FOR THE OS WAREHOUSE IS IN A MANUAL AND IS APPROXIMATELY .0414 (HIS ESTIMATE AS TO WHAT IT WAS). HOWEVER, THE .5% SHOULD SUFFICE.PI: THE SHORTAGE PENALTY COST, PI, IS THE COST ASSOCIATED WITH A SPARE PART BEING STOCKED OUT AND CAUSING A VFC TO GO AWD. THE COST IF THE SHORTAGE IS DETERMINED BY (1) THE HOURS ASSOCIATED WITH PERFORMING A ROBBACK AND PREPARING THE VFC FOR SERVICE. ESTIMATED TIME IS 3 HRS FROM THE SHOP.

$$3 \text{ HRS} \times 11.27/\text{HR} = \$33.81$$

(4610 STEP 5)

(2) COST OF CAPITAL FOR THE PART. PI

THIS COST PROBABLY WON'T APPLY, BUT SINCE NO ONE ON THE BASE HAS ANY IDEA OF WHAT IT COSTS THE AIR FORCE TO HAVE A VFC SIT IN STORAGE FOR (SAY) 60 DAYS, THE COST OF CAPITAL WILL BE USED AS A STARTING POINT. SINCE THE VFC IS A TANGIBLE ASSET, ITS CARRYING COST CAN BE THOUGHT OF AS

DDB SECTION CODE

7.0

DDB PAGE NO. _____

091019

ENGINEERING NOTES

EMPLOYEE _____

DATE _____

PAGE NO. 2

RCC _____

SUBJECT _____

21,150 - AVG PAYMENT FOR REPAIR OF A UFC TO MTPFA,

8.23,836 - FIS (OBTAINED FROM WENDY HALDEN X56224)
 18,463 - F16

$$21,150 \times .084 \times \frac{\# \text{ DAYS IN AWP}}{365 \text{ DAYS}}$$

(10-YR T-BILL
GOVERNMENT DISMISSARY)
NOTES

MEAN DEMAND PER PERIOD:
 (M) (QUARTERLY)

THE REQUIREMENT FOR THE SPARE
 PART BASED UPON TOTAL UFC REQUIREMENTS
 AND THE PERCENTAGE REPLACEMENT FACTOR

EX: 23 JULY 1970 CRITICAL SHORTAGE REPORT

1131 PT 178 $\times .06 = 10.68$
 NOT NUMBERING

MEAN DEMAND DURING LEAD
 TIME (ML)

DIVIDE THE QUARTERLY REQUIREMENT BY
 3 AND MULTIPLY THAT MONTHLY REQUIREMENT BY THE
 NO. MONTHS IN THE GIVEN LEAD TIME (OBTAINED
 FROM THE ITEM MANAGER, X56224) TO OBTAIN THE MEAN
 LEAD TIME DEMAND.

EX: 1131 PT $\frac{17.2}{3} \times 28 = 160.53 = 161$

ENGINEERING NOTES

EMPLOYEE _____

DATE _____

PAGE NO. 3

RCC _____

SUBJECT _____

LEAD TIME DEMAND δ : TAKED THE 5 XTRS OF LEAD TIME DEMAND
(S16) DATA, OBTAIN \bar{x} AND δ .

PURCHASE COST/UNIT: OBTAINED FROM ITEM MANAGER FOR EACH SPARE
PART. THE QUOTED COST REPRESENTS THE MOST
RECENT COST AND FOR THE SPARE PART. PURCHASE
COST AS BY BULK QUANTITY.

LEAD TIME T: OBTAINED FROM THE ITEM MANAGER. REPRESENTS BOTH
ADMINISTRATIVE LEAD TIME AND PRODUCTION LEAD TIME
(ADM AND PROD)

EX: 7831 PT: ADM 9 PROD 19 = 28 MONTHS LEAD TIME

THREE ITEMS (THE 7831 PT MOTOR, THE 6759 PT TUBE ASSY,
AND THE 3948 PT VALVE ASSY) WERE UTILIZED IN THE INVENTORY
MODEL BECAUSE THEY APPEARED ON THE SCROOVING CRITICAL SHORTAGE
REPORT. DATA WERE ACCUMULATED FOR FIVE QUARTERS.

THE VARIABLES WERE INPUTTED IN THE MODEL FORMULATION (SEE
PRINTOUT). THE COST MINIMIZATION OBJECTIVE FUNCTION WAS
FORMULATED AS SUCH (SEE MANUAL, PG. 7K):

$$MIN = C1 * M1 + H1 * (R - ML + \frac{Q}{2}) + (H * ML / (2Q)) + M * PI / Q \\ * S16 * PSL(W)$$

REPEAT THE ABOVE FORMULA FOR EACH SPARE PART INPUTTED TO THE
MODEL.

ENGINEERING NOTES

EMPLOYEE _____

DATE _____

PAGE NO. 4

RCC _____

SUBJECT _____

COMPARISON EOQ'S WERE OBTAINED FROM MMM (GILBERT VADILLO, X58599) FROM THE EOQ REPORTS GENERATED FROM HEADQUARTERS FORMULA.

RESULTS FROM THE TESTING OF 3 PARTS (7831PT WOOD MEASURING, 3948 VALVE ASSY, AND 6759PT ASSY) WERE AS FOLLOWS:

		<u>MODEL</u>	<u>ACTUALS</u>
7831PT	R1	220	88
	Q1	3	12
6759PT	R2	169	255
	Q2	201	201
3948PT	R3	713	359
	Q3	55	142

ALTHOUGH THE 6759PT FIGURES FROM THE MODEL SEEM FEASIBLE, THE OTHER TWO PARTS SHOW DISPARITY. IT CANNOT BE EMPHASIZED ENOUGH THE IMPORTANCE OF HAVING ACCURATE FIGURES FOR THE MODEL BEING CONSIDERED, IT IS RECOMMENDED STRONGLY THAT PROCEDURES FOR DETERMINING INVENTORY COSTS BE DEVELOPED AS THE AIR FORCE MOVES TOWARD COSTING METHODS.

MOMSC RECOMMENDS THE EXAMINATION OF THIS EOQ MODEL ACCOUNTING FOR RANDOM DEMAND FOR ITS EOQ DETERMINATION ALONG WITH STOCK MODELS. AS STOCK-OUT OCCURRENCES HAVE BEEN REDUCED SIGNIFICANTLY OVER THE PAST SIX MONTHS BUT AT A SIGNIFICANT COST. SOME STOCK-OUTS ARE STILL OCCURRING. ALTHOUGH PART SHORTAGES ARE PERHAPS ONLY 10% OF THE TOTAL LFC PRODUCTION PROBLEMS, A SIGNIFICANT REDUCTION OF THE SHORTAGE PROBLEMS COULD ENABLE PRODUCTION TO INCREASE THROUGHOUT BY PERHAPS 10 LFC'S PER MONTH.

ENGINEERING NOTES

252

EMPLOYEE _____ DATE _____ PAGE NO. _____
RCC _____ SUBJECT _____

291501042 291501042 291501259 291501021 291501352
7942 PT 7831 PT 7073 PT 3948 PT 6759 PT
QST BODY BOY MEETING ACTUATOR PISTON VALVE ASSY TWE ASSY

QTR 3 89	11	17	81	76	30
QTR 4 89	11	14	40	65	24
QTR 1 90	17	19	-	82	32
QTR 2 90	17	18	66	82	31
QTR 3 90	18	18	64	83	32
QTR 4 90				85/170 27/25	105/170 17/10

$\bar{X} = 14.8$ 17.2 72.6 29.8
 $\sigma = 3.1241$ 1.7205 6.7705 2.9933
99 57

QV6 #
OF DAYS
P

T-BILL ~~RE~~ : 8.47%

LEAD-TIME
DEMAND

139	159	532	140
140	131	455	112
215	177	574	149
215	168	574	145
228	168	581	150
$\bar{X} = 187.4$	$\bar{X} = 161.6$	$\bar{X} = 543.2$	$\bar{X} = 139.2$
$\sigma = 39.3925$	$\sigma = 15.6569$	$\sigma = 49.3137$	$\sigma = 14.2425$
DDB SECTION CODE	9.0	DDB PAGE NO.	091024

ENGINEERING NOTES

EMPLOYEE _____ DATE _____ PAGE NO. _____
 RCC _____ SUBJECT _____

~~\$ 43.44 / HR TOTAL RATE~~

SHORTAGE PENALTY COST CALCULATION

AVL 3 HR ROBOPLK

$$\underline{7831} : (21150 \times .084 \times \frac{365.10}{365}) + (3 \text{ HRS} \times \frac{33.81}{11.27/\text{HR}}) = 1398.91$$

$$\underline{6759} : (21150 \times .084 \times \frac{277.44}{365}) + (3 \text{ HRS} \times \frac{11.27}{11.27/\text{HR}}) = \$ 311.25$$

$$\underline{3948} : (21150 \times .084 \times \frac{99}{365}) + (\quad \quad \quad) = \$ 515.68$$

$$\underline{7942} : (21150 \times .084 \times \frac{438.07}{365}) + (\quad \quad \quad) = \$ 471.88$$

EMPLOYEE _____

DATE _____

PAGE NO. _____

RCC _____

SUBJECT _____

- (1) CONSTANT
(2) OBJ FUNC
(3) CONSTRAINTS

INVENTORY EQ MODEL (RANDOM DEMAND)

$$\text{MIN} = K * M/Q + CM + H(R - ML + Q/2) + (H * ML/(2Q) + M * PI/Q) * SIG * PSL(U)$$

$$\begin{aligned} \text{MIN} = & C_1 M_1 + H_1 (R_1 - ML_1 + Q_1/2) + \\ & (H_1 * ML_1/(2Q_1) + M_1 * PI_1/Q_1) * SIG_1 * PSL(U_1) \\ & + C_2 M_2 + H_2 (R_2 - ML_2 + Q_2/2) + \\ & (H_2 * ML_2/(2Q_2) + M_2 * PI_2/Q_2) * SIG_2 * PSL(U_2) \\ & + C_3 M_3 + H_3 (R_3 - ML_3 + Q_3/2) + \\ & (H_3 * ML_3/(2Q_3) + M_3 * PI_3/Q_3) * SIG_3 * PSL(U_3) \end{aligned}$$

$$\text{S.T. } C_1 Q_1 + C_2 Q_2 + C_3 Q_3 \leq C$$

ENGINEERING NOTES

EMPLOYEE _____

DATE _____

PAGE NO. 1

RCC _____

SUBJECT _____

MODEL

DETERMINATION OF REORDER POINT (R) AND INITIAL INVENTORY QUANTITY (Q) FOR 3 SPACE PARTS IF THE LFC GIVEN IN MM BUDGET CONSTRAINT.

THERE IS NO SETUP COST, SO $K=0$.

THE 3 HOLDING COSTS:

- 1) $H_1 = 4.43$;
- 2) $H_2 = 0.72$; ~~4) $H_4 =$~~
- 3) $H_3 = 1.66$;

THE 3 SHORTAGE PENALTY COSTS:

- 5) $PI_1 = 398.91$;
- 6) $PI_2 = 311.25$; ~~8) $PI_4 =$~~
- 7) $PI_3 = 515.68$;

THE MEAN DEMANDS FOR THE 3 PARTS:

- 9) $M_1 = 17.2$;
- 10) $M_2 = 29.8$; ~~12) $M_4 =$~~
- 11) $M_3 = 77.6$;

THE 3 MEAN DEMANDS FOR THE PARTS DURING LEAD TIME:

- 13) $M_{L1} = 162.6$;
- 14) $M_{L2} = 131.2$; ~~16) $M_{L4} =$~~
- 15) $M_{L3} = 543.2$;

THE 3 STANDARD DEVIATIONS:

- 17) $SI_1 = 15.8569$;
- 18) $SI_2 = 14.0485$; ~~20) $SI_4 =$~~
- 19) $SI_3 = 49.3937$;

THE PURCHASE COST FOR EACH OF THE THREE PARTS:

- 21) $C_1 = 355.40$;
- 22) $C_2 = 143.58$; ~~24) $C_4 =$~~
- 23) $C_3 = 331.12$;

THE MODEL WILL DETERMINE:

$Q_1, Q_2, Q_3, Q_4 =$ THE 3 ORDER QUANTITIES.

$R_1, R_2, R_3, R_4 =$ THE 3 ORDER POINTS.

ENGINEERING NOTES

EMPLOYEE _____

DATE _____

PAGE NO. 2

RCC _____

SUBJECT _____

! THE COST OBJECTIVE FUNCTION TO BE MINIMIZED:

$$25) \text{ MIN} = C1 * M1 + H1 * (R1 - M1 + Q1/2) +$$

$$(H1 * M1 / (2Q1) + M1 * PI1 / Q1) * SIG1 * PSL(U1) +$$

$$C2 * M2 + H2 * (R2 - M2 + Q2/2) +$$

$$(H2 * M2 / (2Q2) + M2 * PI2 / Q2) * SIG2 * PSL(U2) +$$

$$C3 * M3 + H3 * (R3 - M3 + Q3/2) +$$

$$(H3 * M3 / (2Q3) + M3 * PI3 / Q3) * SIG3 * PSL(U3);$$

! THE REORDER POINTS ARE PUT INTO STANDARDIZED FORM:

$$26) U1 = (R1 - M1) / SIG1;$$

$$27) U2 = (R2 - M2) / SIG2;$$

$$28) U3 = (R3 - M3) / SIG3;$$

$$29) U4 = (R4 - M4) / SIG4;$$

! THE MM BUDGET CONSTRAINT IS ADDED:

$$30) C = 150,000$$

$$31) C1Q1 + C2Q2 + C3Q3 + C4Q4 < 0.35 * C;$$

END

G. CHEN - J. DEW - 12/3/89
S. ARROW / KAT x 5857

0910160

C/N	APPL	NOUN	STOCK NUMBER	IRQMT	PROD	PRO RATA	IOWO	AWP	%
09676A	F100	UFC (F15)	2915 01 064 5946PT	E 8	3	3	0	0	100
				M 170	63	54	107	2	117
12572A	F100	UFC (F16)	2915 01 201 6783PT	E 8	5	3	2	0	167
				M 130	46	41	107	4	112
FY 90-4	EI/NEG	EI/ACCPT	FAMILY TOTALS	E 16	8	5	2	0	160
	197	170		M 300	109	95	214	6	108
	103	130							

NSN	NOUN	P/N	UPA	REP%	MONTHLY QTY REQ	QTRLY REQMT	SOS	"G" COND	AWP
*1) 2915 01 042 7831PT BODY METERING		2660537	1/1	6/6	3/3	10/8	FPZ	31/7	2/4
*2) 2915 01 006 3031PT RCW VALVE BODY		2659364	1/1	3/4	2/1	4/3	FPZ	23/1	0
3) 4710 00 382 6759PT TUBE ASSY		2650680	1/1	10/10	6/5	18/14	FPZ	4/0	0
4) 2915 00 357 2503PT RETAINER		2652943	1/1	20/27	12/12	36/37	FPZ	0	0
5) 2915 01 021 3948PT VALVE ASSY		2660553	1/1	27/25	16/12	48/35	FPZ	0	0
6) 2915 01 259 7083PT ACTUATOR PISTON		2675530	1/1	5/40	3/18	9/55	FPZ	0	0
7) 2915 01 312 0777PT BODY		2675331	1/1	5/5	3/2	9/7	FPZ	0	0
8) 2915 01 042 7942PT DIST BODY		2660588	1/1	6/5	4/2	11/7	FPZ	0	0
9) 5360 00 508 9335PT SPRING SPIRAL		2654093	1/1	23/48	13/22	39/66	FPZ	19/5	0
10) 9150 00 583 6065PT CABLE ASSY SPEC		184768	1/1	24/24	14/11	43/33	FPZ	7/2	0
PREPARED BY ENRIQUE SANCHEZ/54377									
						DATE: 30 JUL 90	PAGE 1		

257

406 1-41 2-11-11

5 6474

5 224

9.0

252

C/N	APPL	NOUN	STOCK NUMBER	RQMT	PROD	PRO RATA	OWO	AWP	%
12453A	F16	BACKUP CONTROL	2915 01 133 2467PT	E 4 M	3 35	1 35	0 37	0 11	300 100
FY90-4	EI/NEG	EI/ACCPT							
	110	110							

090030

NSN	NOUN	P/N	UPA	REP%	MONTHLY QTY REQ	QTRLY REQ/IT	SOS "G" COND	AWP
2915 01 082 4015PT	HOUSING	767500-3	1	15	6	7	FPZ 0	5
5330 01 074 5434PT	SEAL	69259-2	10	100	367	1110	FPZ 0	7
5330 01 079 7306	PACKING	M25988/2-031	1	100	37	110	FPZ 0	0

PREPARED BY: J. PITTMAN/EXT 57744

DATE: 30 JUL 90

PAGE 2

c'b

259

C/N	APPL	NOUN	STOCK NUMBER		RQMT	PROD	PRO RATA	OWO	AWP	%
11759A	F100	AUGMENTOR PUMP CONTROLLER	2915 01 137 6551PT	E	10 M	2	3	0	0	66
FY 90-4	EI/NEG	EI/ACCPT			120	40	39	48	32	103
	120	120								

130-460

NSN	NOUN	P/N	UPA	REP%	MONTHLY QTY REQ	QTRLY REQMT	SOS "G" COND	AWP
2915 00 279 5776PT	HOUSING	2653474	1	11	4	13	FPZ 30	25
2915 00 345 4020PT	LEVER ASSY	2651948	1	5	2	6	FPZ	9

0.6

PREPARED BY: J. PITTMAN/EXT 54377

DATE: 30 JUL 90

PAGE 3

260

ECONOMIC ORDER QUANTITY DISPLAY

11827019

A S STOCK NUMBER: 4710 00 382 6759 PT
 ACTUAL STOCK NUMBER: [REDACTED]

NOUN: TUBE ASSE

CURRENT DATE/TIME: 08/08/90 10:24
 LAST CHANGE DATE/TIME: 16/10/90 12:00

													DATES					
MGR	EQUIP	SUBX	P	ORDER	OF	USE	[REDACTED]	PSG	UNIT OF	UNIT	PRICES	ENTRY	DECAF	SHIFT	ED	EDC		
DESG	SPED	GRP	P	1ST	2ND	3RD	4TH	ADM	PROD	CODE	MEASURE	STANDARD	ACTUAL	DATE	DATE	DATE	REVIEW	
6AK	AS							5	6	8	3	EA	\$ 159.44	\$ 140.38	74/59	0	90181	89010

MGT PMI SSER TYPE													STATUS CODES			SPED	EST DMS	DATE/NUMBER OF PRIOR NOTICES			
BUDGET CODE	ERRD	SMGC	INT	CD	IEC	COMP	RF	MYP	ESS	HIS	AMC	DEL	SUP	S/L	INV	JM	CODE	(IF NEW)	BUY #	DATE#	TERM#
1 328Y	N	P		E		B	15	JAE		3H									90181/1	90186/2	89011/0

PEACE	PROG	LT DAYS	LEADTIME	CONDEM	IMPLD	WEAROUT	MANUFACTURER'S		MANUAL FILE MAINT	
PGM RATIO	CODE	ALT	PLT	SUPPRESS	FACTOR	SHRT FCTR	FACTOR/CD	PART NUMBER	FROM	OVERRIDE CODE
1.140		181E	205E		1.00	3.19	.00006 /C	2650680		66848

SERVICEABLE ASSETS		DUE IN ASSETS		UNSERVICEABLE		MEMO				
IM ACCT	09 ACCT	TOTAL	PR	CONTR	TOTAL	NET	MIC	DEP SUP	INTRANS	ON CD
0	0	215	0	215	0	0	0	0	0	0

FUTURE REQUIREMENTS												
	1ST	2ND	3RD	4TH	5TH	6TH	7TH	8TH	9TH	10TH	11TH	12TH
QUANT RQMTS	0	0	0	100	26	26	26	0	0	0	0	0
DLM RQMTS	5	2	2	2	2	2	2	2	2	2	2	2

REQUISITION FREQUENCY										FREQUENCY OF DEMAND	
	CURRENT	1ST	2ND	3RD	4TH	5TH	6TH	7TH	8TH	QUARTER TALLY	
NBR RQMTS	0	11	49	0	0	0	2	0	0	08	

COMPUTED LEVELS AND REQUIREMENTS												
	[REDACTED]	DUE OUT	SAF LVL	WRM ROL	[REDACTED]	[REDACTED]	DATA LEVEL	TERM LEVEL	ADJ TERT LEVEL	WRM AFAC	AFAC	RETENTN LEVEL
DEMANDS	61	35	12	0	108	62	108	107	405	0	0	1070
QUANT RQMTS	147	0	0	0	147	11	130	100				100
DLM RQMTS	0	0	0	0	0	0	0	0				0
TOTAL	208	35	12	0	255	123	308	405	405	0	477	1280

COMPUTED RATES AND FACTORS												
PROGRAM DEMAND RATES				EOQ	MISC	3Q ROOT	YEAR ASS	ASSETS	REORDER LEVEL	MEMO		
EOQ/SAV LEVEL	MONTHLY	ANNUAL	YEARS	PRIORITY	AV REAN	DEVIATION	USED IN COMP	OVRS/SHRTS	DEPOT SUPPLY LEVEL/CD			
4.46	4.46	33.33	1.15	7	1.20	17.07	215	40		41.10		

PAGE 1 OF 2

9.0

091002

261

ECONOMIC ORDER QUANTITY DISPLAY

11820019

S STOCK NUMBER: 4710 00 382 6759 PT
ACTUAL STOCK NUMBER: 4710 00 382 6759 PT

NOUN: TUBE ASSE

CURRENT DATE TIME: 08/08/91 10:24
LAST CHANGE DATE TIME: 08/08/90 12:00

DEMANDS	CURRENT	1ST	2ND	3RD	4TH	5TH	6TH	7TH	8TH	
TRANSFER	0	0	0	0	0	0	0	0	0	DEMAND QTY TALLY: 16
NONRECUR	0	0	0	0	0	0	0	0	0	CURRENT QTY TALLY: 3,000
TOTAL SALES	0	11	80	0	0	0	0	0	0	DATE LAST DEMAND: 78272
AFLO DEPOT	0	11	78	0	0	0	0	0	0	
CONTRACTOR	0	0	2	0	0	0	0	0	0	
FMS	0	0	0	0	0	0	0	0	0	
ARMY	0	0	0	0	0	0	0	0	0	
NAVY	0	0	0	0	0	0	0	0	0	
MARINES	0	0	0	0	0	0	0	0	0	
OTHER	0	0	0	0	0	0	0	0	0	

RETURNS										
TRANSFER	0	0	0	0	0	0	0	0	0	
TOTAL SALES	0	0	0	0	0	0	0	0	0	
AFLO DEPOT	0	0	0	0	0	0	0	0	0	
CONTRACTOR	0	0	0	0	0	0	0	0	0	
ARMY	0	0	0	0	0	0	0	0	0	
NAVY	0	0	0	0	0	0	0	0	0	
MARINES	0	0	0	0	0	0	0	0	0	
OTHER	0	0	0	0	0	0	0	0	0	

DEMANDS USED IN COMP										
EQ/SL DMDS	0	11	80	0	0	0	0	0	0	
NET DEMANDS	0	11	80	0	0	0	0	0	0	

DEMANDS	9TH	10TH	11TH	12TH	13TH	14TH	15TH	16TH	
TRANSFER	0	0	0	0	0	0	0	0	
NONRECUR	0	0	0	0	0	0	0	0	
TOTAL SALES	0	0	0	5	0	0	12	1	
AFLO DEPOT	0	0	0	5	0	0	0	0	
CONTRACTOR	0	0	0	0	0	0	10	1	
FMS	0	0	0	0	0	0	0	0	
ARMY	0	0	0	0	0	0	0	0	
NAVY	0	0	0	0	0	0	0	0	
MARINES	0	0	0	0	0	0	0	0	
OTHER	0	0	0	0	0	0	0	0	

RETURNS									
TRANSFER	0	0	0	0	0	0	0	0	
TOTAL SALES	0	0	0	0	0	0	0	0	
AFLO DEPOT	0	0	0	0	0	0	0	0	
CONTRACTOR	0	0	0	0	0	0	0	0	
ARMY	0	0	0	0	0	0	0	0	
NAVY	0	0	0	0	0	0	0	0	
MARINES	0	0	0	0	0	0	0	0	
OTHER	0	0	0	0	0	0	0	0	

DEMANDS USED IN COMP									
EQ/SL DMDS	0	0	0	5	0	0	14	1	
NET DEMANDS	0	0	0	5	0	0	14	1	

9.0

091033

PAGE 2 OF 2

PRESENT TIME: 01-01-00 00:00
 PRESENT TIME: 00-01-00 00:00

										----- DATES -----							
MGR	EDWF	SUBX	P	ORDER	OF	USE	PSD	UNIT	OF	UNIT	PRICE	ENTRY	DELET	CHG	ED	STG	
DESG	SPCL	GRP	P	1ST	2ND	3RD	1ST	2ND	3RD	MEASURE	STANDARD	ACTUAL	DATE	DATE	DATE	REASON	
BRK	AC						6	11	10	3	EA	\$ 254.92	\$	254.92	76-06		100%

BUDGET CODE	ERRC SNGO	INT DC	LED COMF	RF	XPF	ESS HIB	AND DEL	SUP SAL	INV JY	CODE	REF NEW	DATE#	TERM#
: 008Y	N	P	A	B	15	CDE	GH			I	J	KKLLMM	NNNNNN

PERCE	PROD	LT DAYS	LEADTIME	CONDEN	IMPLD	WEAROUT	MANUFACTURING	ANAL FILE
PGM RATIO	CODE	PLT	SUPPRESS	FACTOR	GRFT FCTR	FACTOR/CD	PART NAMEST	FILE
1.14%		345A	295A	1.00	3.12	0.0004 / 0	210000	100-0

SERVICEABLE ASSETS		DUE IN ASSETS		UNSERVICEABLE		TOTAL	
19 ADCT	19 ADCT	TOTAL	AS	TOTAL	NET	19 ADCT	19 ADCT
2	1	333	280	9	3	12	21

[illegible]

REQUISITION FREQUENCY										FREQUENCY OF DEMAND FOR THE TROOP
	CURRENT	1ST	2ND	3RD	4TH	5TH	6TH	7TH	8TH	
NBS POINTS	4	10	10	21	10	14	12	6	1	40

[illegible]

PROGRAM DEMAND RATES			COMPUTED RATES AND FACTORS							
ECONOMY LEVEL	MONTHLY	ANNUAL	YEAR	MISC	90	ROOT	FEED	ASST	REDUCED LEVEL	TIME
			PRIORITY	BY	DEMON	DEVIATION	USED IN COMP	CHARGE	DEPT	SUPPLY LEVEL
12.45	12.45	144.60	1.05	1	1.00	10.00	1.00	1.00	1.00	1.00

433

9.0

091054

263

ECONOMIC ORDER QUANTITY DISPLAY

11829116

8 B STOCK NUMBER: 2915 01 021 3948 PT
 ACTUAL STOCK NUMBER: 2915 01 021 3948 PT

NOUN: VALVE ASS

CURRENT QUANTITY: 10/00/00 10/00/00
 LAST CHANGE DATE/TIME: 05/00/00 12:00

DEMANDS	CURRENT	1ST	2ND	3RD	4TH	5TH	6TH	7TH	8TH	
TRANSFER	0	0	0	0	0	10	0	0	0	
NONRECUR	0	0	0	0	0	0	0	0	0	
TOTAL SALES	0	64	13	13	28	41	37	26	30	
AFLO DEPOT	0	64	13	13	28	41	37	26	30	
CONTRACTOR	0	0	0	0	0	0	0	0	0	
ARMY	0	0	0	0	0	0	0	0	0	
NAVY	0	0	0	0	0	0	0	0	0	
MARINES	0	0	0	0	0	0	0	0	0	
OTHER	0	0	0	0	0	0	0	0	0	

DEMAND QTY TALLY: 11
 CURRENT QTY TALLY: 11829116
 DATE LAST DEMAND: 05/00/00

RETURNS

TRANSFER	0	0	0	0	0	0	0	0	0
TOTAL SALES	0	0	0	0	0	0	0	0	0
AFLO DEPOT	0	0	0	0	0	0	0	0	0
CONTRACTOR	0	0	0	0	0	0	0	0	0
ARMY	0	0	0	0	0	0	0	0	0
NAVY	0	0	0	0	0	0	0	0	0
MARINES	0	0	0	0	0	0	0	0	0
OTHER	0	0	0	0	0	0	0	0	0

DEMANDS USED IN COMP

EQQ/SL DMDS	0	64	13	13	28	51	37	26	30
NET DEMANDS	0	64	13	13	28	51	37	26	30

DEMANDS	9TH	10TH	11TH	12TH	13TH	14TH	15TH	16TH
TRANSFER	0	0	0	0	0	0	0	0
NONRECUR	0	0	0	0	0	0	0	0
TOTAL SALES	21	30	27	3	0	23	0	40
AFLO DEPOT	21	30	27	3	0	23	0	45
CONTRACTOR	0	0	0	0	0	0	0	0
ARMY	0	0	0	0	0	0	0	0
NAVY	0	0	0	0	0	0	0	0
MARINES	0	0	0	0	0	0	0	0
OTHER	0	0	0	0	0	0	0	0

RETURNS

TRANSFER	0	0	0	0	0	0	0	0
TOTAL SALES	0	0	0	0	0	0	0	0
AFLO DEPOT	0	0	0	0	0	0	0	0
CONTRACTOR	0	0	0	0	0	0	0	0
ARMY	0	0	0	0	0	0	0	0
NAVY	0	0	0	0	0	0	0	0
MARINES	0	0	0	0	0	0	0	0
OTHER	0	0	0	0	0	0	0	0

DEMANDS USED IN COMP

EQQ/SL DMDS	21	30	27	3	0	23	0	40
NET DEMANDS	21	30	27	3	0	23	0	40

9.0

091035

PAGE 1 OF 2

264

ECONOMIC ORDER QUANTITY DISPLAY

11025010

3 S STOCK NUMBER: 2915 01 042 7831 PT
ACTUAL STOCK NUMBER: [REDACTED]

NOUN: BODY, YETE

CURRENT DATE/TIME: 08/28/93 10:14

LAST CHANGE DATE/TIME: 06/30/93 12:00

										UNIT PRICES		DATES					
MGR	EQUIP	SUBX	P	ORDER	OF	USE	[REDACTED]	PSO	UNIT OF	STANDARD	ACTUAL	ENTRY	DECAF	SHIFT	EQ	STD	
DESG	SPED	GRP	P	1ST	2ND	3RD	IFP	ADM	PROD	CODE	MEASURE	DATE	DATE	DATE	REVIEW		
6AH	JZ						6	9	19	C	EA	\$ 911.96	\$ 828.10	98120	0	99181	99990

MGT PMI SSED TYPE										STATUS CODES				SPED	EST DMO3	DATE/NUMBER OF PRIOR NOTICES					
BUDGET CODE	ERRC	SMGO	INT	CD	IEC	COMP	RF	MYP	ESS	HIS	AMC	DEL	SUP	S/L	INV	JM	CODE	(IF NEW)	BUY /#	DATA /#	TERM /#
1 328Y	N	M				B	15	72Z	3H					8	N		72		070	070	070

PEACE		PROG	LT DAYS	LEADTIME	CONDEM	IMPLD	WEAROUT	MANUFACTURER'S		MANUAL FILE MAINT	
PGM RATIO	CODE	ALT	PLT	SUPPRESS	FACTOR	SHRT FCTR	FACTOR/CD	PART NUMBER		FROM	OVERIDE CODE
1.140		288A	567Q		1.00	3.10	.00000 /	2660537		06848	

SERVICEABLE ASSETS		DUE IN ASSETS		UNSERVICEABLE		YEM				
IM ACCT	09 ACCT	TOTAL	PR	CONTR	TOTAL	NET	MIC	DEF SUP	INTRNS	CH CC 2
0	0	187	100	87	48	0	11	0	0	0

FUTURE REQUIREMENTS												
	1ST	2ND	3RD	4TH	5TH	6TH	7TH	8TH	9TH	10TH	11TH	12TH
QUANT RQMTS	0	0	0	0	0	0	0	0	0	0	0	0
DLM RQMTS	0	0	0	0	0	0	0	0	0	0	0	0

REQUISITION FREQUENCY										FREQUENCY OF DEMAND	
	CURRENT	1ST	2ND	3RD	4TH	5TH	6TH	7TH	8TH	QUARTER TALLY	
NBR RQMTS	0	5	0	0	0	0	0	0	0	01	

COMPUTED LEVELS AND REQUIREMENTS												
	DUE OUT	SAF LVL	WRM ROL	[REDACTED]	[REDACTED]	DATA LEVEL	TERM LEVEL	EOJ TERM LEVEL	JAF AFAD	AFAD	RETENTN LEVEL	
DEMANDS	28	60	0	0	38	12	92	106	106	0	124	124
QUANT RQMTS	0	0	0	0	0	0	0	0	0	0	0	0
DLM RQMTS	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	28	60	0	0	38	12	92	106	106	0	124	124

COMPUTED RATES AND FACTORS										YEM		
PROGRAM DEMAND RATES		EQO	MIEO	SO ROOT	MEAN	ASSETS	REORDER LEVEL					
EQO/SAV LEVEL	MONTHLY	ANNUAL	YEARS	PRIORITY	AV REQ	DEVIATION	USED IN COMP	OVRRGE/SHRTG	DEPOT SUPPLY	LEVEL/CODE		
1.00	1.00	12.00	1.01	77	1.00	2.51	107	00		00 00		

9.0

091036

265

ECONOMIC ORDER QUANTITY DISPLAY

L1825218

S S STOCK NUMBER: 2915 01 042 7831 PT
ACTUAL STOCK NUMBER: 2915 01 042 7831 PT

NOON; BODY, NETE

CURRENT DATE/TIME: 18/08/92 10:12
LAST CHANGE DATE/TIME: 06/08/92 12:00

DEMANDS	CURRENT	1ST	2ND	3RD	4TH	5TH	6TH	7TH	8TH	
TRANSFER	0	0	0	0	0	0	0	0	0	DEMAND QTY TALLY: 01
NONRECUR	0	0	0	0	0	0	0	0	0	CURRENT QTY TALLY: 0.000
TOTAL SALES	0	5	0	0	0	0	0	0	0	DATE LAST DEMAND: 06/07/92
AFLO DEPOT	0	5	0	0	0	0	0	0	0	
CONTRACTOR	0	0	0	0	0	0	0	0	0	
FMS	0	0	0	0	0	0	0	0	0	
ARMY	0	0	0	0	0	0	0	0	0	
NAVY	0	0	0	0	0	0	0	0	0	
MARINES	0	0	0	0	0	0	0	0	0	
OTHER	0	0	0	0	0	0	0	0	0	
RETURNS										
TRANSFER	0	0	0	0	0	0	0	0	0	
TOTAL SALES	0	0	0	0	0	0	0	0	0	
AFLO DEPOT	0	0	0	0	0	0	0	0	0	
CONTRACTOR	0	0	0	0	0	0	0	0	0	
ARMY	0	0	0	0	0	0	0	0	0	
NAVY	0	0	0	0	0	0	0	0	0	
MARINES	0	0	0	0	0	0	0	0	0	
OTHER	0	0	0	0	0	0	0	0	0	
DEMANDS USED IN COMP										
EOQ/SL DMDS	0	5	0	0	0	0	0	0	0	
NET DEMANDS	0	5	0	0	0	0	0	0	0	
DEMANDS	9TH	10TH	11TH	12TH	13TH	14TH	15TH	16TH		
TRANSFER	0	0	0	0	0	0	0	0		
NONRECUR	0	0	0	0	0	0	0	0		
TOTAL SALES	0	0	0	0	0	0	0	0		
AFLO DEPOT	0	0	0	0	0	0	0	0		
CONTRACTOR	0	0	0	0	0	0	0	0		
FMS	0	0	0	0	0	0	0	0		
ARMY	0	0	0	0	0	0	0	0		
NAVY	0	0	0	0	0	0	0	0		
MARINES	0	0	0	0	0	0	0	0		
OTHER	0	0	0	0	0	0	0	0		
RETURNS										
TRANSFER	0	0	0	0	0	0	0	0		
TOTAL SALES	0	0	0	0	0	0	0	0		
AFLO DEPOT	0	0	0	0	0	0	0	0		
CONTRACTOR	0	0	0	0	0	0	0	0		
ARMY	0	0	0	0	0	0	0	0		
NAVY	0	0	0	0	0	0	0	0		
MARINES	0	0	0	0	0	0	0	0		
OTHER	0	0	0	0	0	0	0	0		
DEMANDS USED IN COMP										
EOQ/SL DMDS	0	0	0	0	0	0	0	0		
NET DEMANDS	0	0	0	0	0	0	0	0		

9.0

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AS OF: 30 JUL 90

UFC PARTS CONSTRAINTS

NSN	QTY-AWP 15/16	UPA	REPLX	MO REQT	QTR REQT	O/H	A/AX	B/O	REMARKS
1. 2915 01 042 7831PT BODY METERING ASSY	2/4	1/1	6/6	3/3	10/8	0	0/0	59	EDD: DUE IN SA9W - 45 EA, 34 EA DUE SEP 90, 25 EA DUE OCT 90, 28 EA DUE NOV 90 - PR90-60284: 53 EA. WITHIN 12 MO QTY OF 100 EA, JUL 91.
2 2915 01 006 3031PT RCVV VALVE BODY	0/0	1/1	3/4	2/1	4/3	4	0/0	19	CASTING HAS BEEN RESOLVED. SA7J - 10 EA DUE AUG 90, 10 EA DUE SEP 90 15 EA DUE OCT 90, 15 EA DUE NOV 90 15 EA DUE DEC 90, 10 DEC 90 SA3H: 22 EA DUE IN - JUL 90 5 EA DUE DEC 90, 17 EA DUE JAN 90
3. 4710 00 382 6759PT TUBE ASSY	0/0	1/1	10/10	6/5	18/14	0	0/0	5	53 EA DUE AUG 90 ON 90M2995 ON PR 90-61259 INITIATED 18 APR 90 HAND-WALKED PR 92597 FOR QTY 162 EA EDD: DELIVERY 60 DAYS AFT AWARDED

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266

AS OF: 30 JUL 90

UFC PARTS CONSTRAINTS

QTY-AWP 15/16	NSN	UPA	REPLX	MO	QTR	REQT	O/H	A/AX	B/O	REMARKS
0/0	2915 00 357 2503PT RETAINER ASSY	1/1	20/27	12/12	36/37	0	0/0	11	11	150 EA DUE AUG 90, 150 EA DUE AUG 90, 187 EA DUE OCT 90.
				12 EA REC'D 10 JUL 90						
				22 EA REC'D 12 JUL 90						
				1 EA REC'D 18 JUL 90						
0/0	2915 01 021 3948PT VALVE ASSY	1/1	27/25	16/12	48/35	32	12/0	0	0	SAC9: DUE IN: 62 EACH, 30 EA DUE AUG 90, 30 EA DUE SEP 90 PREMIUM TRANSPORTATION AVAILABLE PR 90-60113, 26 JUL 89 ADVANCE RELEASED. 203 EA, 30 EA DUE APR 91 TILL SHIPMENT COMPLETE (30 APR 90 COMPL--PR FOR 161 EA) (08 JUN 90, 10 EA)
				61 EA REC'D APR 90						
				31 EA REC'D 31 MAY 90						
				07 EA REC'D 15 JUN 90						
				13 EA REC'D 02 JUL 90						
				9 EA REC'D 03 JUL 90						

0/0	2915 01 259 7083PT ACTUATOR PISTON (P/N 2675530)	1/1	5/40	3/18	9/55	26	0/0	17	17	SAGK: 114 TOTAL DUE IN
				11 EA REC'D, JUN 90						41 EA DUE AUG 90
				22 EA REC'D 02 JUL 90						41 EA DUE SEP 90
				6 EA REC'D 05 JUL 90						
				12 EA REC'D, 06 JUL 90						

THESE COMPLETE ASSYS ARE FULL-UP KITS, INSTEAD, BODY W/O KITS, P/N 2675531 WILL BE PROCURED (2915-01-312-0777PT) EOQ
ITEM SHOP WILL BUILD COMPLETE ASSYS BY USING P/N 2675531

NOTE: (OLD) BODY & PISTON ASSY: 2915-01-354-8673PT, P/N 2653636 AND 2915-01-081-9645PT, P/N 2662855 ARE BEING
MODIFIED TO MEET TCT0543 SPECIFICATIONS OF 2915-01-259-7083PT, P/N 2675530 VIA MACHINE SHOP MODIFICATION AND WITH MOD.
KIT 2915-01-262-2612PT IAW BRADLEY/PLANNER.

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267 8

UFC PART CONSTRAINTS

NSN	QTY-AWP 15/16	UPA	REPLX	MO REQT	QTR REQT	O/H	A/AX	B/O	REMARKS
7. 2915-01-312-0777PT Body	0/0	1/1	5/5	3/2	9/7	0	0/0	16	NO STATUS AS OF 12 JUL 90
8. 2915 01 042 7942PT DIST BODY	0/0	1/1	6/5	4/2	11/7	6	2/0	0	363 ON CONTRACT. 20 PER MO TO START, JAN 91. 10 EA DUE EOM. TOTAL OF 28 EA AS OF MAR 90
			3 EA REC'D APR 90 5 EA REC'D MAY 90 3 EA REC'D 05 JUL 90 2 EA REC'D 09 JUL 90 4 EA REC'D 20 JUL 90						
9 5360 00 508 9355PT SPRING, SPIRAL	0/0	1/1	23/48	13/22	39/66	0	0/0	96	429 EA ON CONTRACT 90 M9061 EDD: EOM OCT 90
10 6150 00 583 6065PT CABLE ASSY, SPEC	0/0 COND 'G' 9	1/1	24/24	14/11	43/33	0	0/0	14	PR 89-60842 301 EA CONTRACT F41608-90-M0025 FOR 301 EA DUE JAN 90

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268 3

AS OF: 30 Jul

UFC PARTS CONSTRAINTS

NSN	QTY-AWP 15/16	UPA	REPLX	MO REQT	QTR REQT	O/H	A/AX	B/O	REMARKS
11 2915 00 279 5759PT HELLOWS ASSY	0/0	1/1	10/40	4/18	11/55	8	57/37	0	DELINQUENT DELIVERY EDD: 133 EA ON CONTRACT, ACCEL OF OF 50 EA MAY 90 THRU JUL 90, 33 EA DUE AUG 90, 35 EA PER MO -- NOV 90 TILL SHIPMENT IS COMPLET
12 2915 00 357 2567PT LEVER & SHAFT	0/0	1/1	25/22	15/11	45/34	7	76/132	0	SA7V 449 EA DUE IN: ACCELERATED 75 EA - JUL 90 THRU OCT 90 59 EA - NOV 90 PR90-60901, 11 JAN 90 FOR 188 EA,
13 2915 00 394 5818PT COVER, COMPUTER RECE	0/0	1/1	11/22	7/10	20/30	0	0/0	32	ADVANCE RELEASE TOTAL CONTRACT MAX LOCATION CHECKED - 0 BAL CONT # 9060873 FOR 81 EA MAX OF 323 EA.
14 3040 01 021 3998PT CAM	0/0	1/1	3/7	2/3	5/10	0	16/2	0	EDD: 37 EA DUE 30 NOV 90 30 EA ON PR 90 -60721, 14 NOV 89 PR WILL CANCEL IF NO B/O ARE ESTABLISHED (IAW MMM FY 90 BUY- POLICY) PR CANCELLED 15 FEB 90
15 5360 00 415 5204PT SPRING, HELICAL TORS	0/0	2/1	3/18	3/11	10/32	2	0/0	20	PR 91-45030 236 EA

269 4

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AS OF: 30 JUL 90

UFC PARTS CONSTRAINTS

NSN	QTY-AWP 15/16	UPA	REPLX	MO REQT	QTR REQT	O/H	A/AX	B/O	REMARKS
16. 2915 00 395 8852PT SERVO VALVE	0/0	1/1	50/100	30/46	89/138	64	0/87	1	EDD: 30 EA SHIPPED 20 FEB 90 ON AIR BILL #204612 30471, DUE IN 2,289 EA SAVI: 150 EA DUE MAR 91 TILL SHIP COMPLETE. TCTO AVAILABLE JUN 90.
17 5365 00 595 7414PT SHIM	0/0	1/1	1/1	1/1	2/1	0	0	15	EMERGENCY PR 736 EA ON SHELF AT BENDIX
18 6150 00 583 6094PT CABLE ASSY	0/0	1/1	22/15	13/7	39/21	10	31/111	0	166 DUE IN 50 EA DUE JUN 90 20 EA DUE JUL 90 87 EA DUE AUG 90 ADVANCE RELEASE PR FOR 111 EA (90-60435) FORECAST AWARD AUG 90
19 2915 00 349 3382PT SWITCH	0/0	1/1	1/2	1/1	2/	0	0	1	65 EA AVAILABLE AT BENDIX NO PR LOCATION IN N34b213G043 WAS CHECKED OUT - 0 BAL

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27/6

AS OF: 30 JUL 90

UFC PARTS CONSTRAINTS

QTY-AWP 15/16	NSN	UPA	REPLX	MO REQT	QTR REQT	O/H	A/AX	B/O	REMARKS
20 3020 00 373 1577PT GEAR RACK	0/0	1/1	9/9	5/4	16/12	11	20/22	0	55 EA DUE MAY 90, SHIPPED 27 APR 90, 86 EA ON PR AWARDED 31 JAN90 NO DELIVERY SCHEDULE, NEEDS ANOTHER PR DUE IN = 14 MOS SUPPORT* CANCELLED A PR 29 JAN 90 DUE TO NO BACKORDERS
21 5365 00 397 6749PT PLUG	0/0	3/3	7/7	12/10	37/29	14	60/86	0	187 EA ON PR CONTRACT MAX 249 EA PR # 9061020
22 2915 01 033 4436PT Cam Assy	0/0	1/1	12/05	7/2	21/7	8	17/35	0	SAF5, SHIPPED COMPLETE 62 EA 71 EA ON PR 90-60114, 251 EA TOTAL CONTRACT Q90, 30 EA ON AUG 90, 71 ON PR 90-60114, 251 EA TOTAL CONTRACT MAX QTY ADVANCE RELEASED PR

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AS OF: 30 JUL 90

UFC PARTS CONSTRAINTS

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NSN	QTY-AWP 15/16	UPA	REPLX	MO	QTR	REQT	O/H	A/AX	B/O	REMARKS
23 2915 00 348 0672PT LEVER	0/0	1/1	6/20	4/9	11/28	12	31/26	0		CONTRACT FOR 320 TO BEGIN 50 EA PER MO TIL COMPLETE, STARTING IN OCT 90 UNTIL SHIPMENT COMPLETE. BENDIX WILL ATTEMPT TO RECOUP START IN JUN 90
					15 EA REC'D, MAY 90					
					3 EA REC'D 14 JUN 90					
					3 EA REC'D 27 JUN 90					
					5 EA REC'D 27 JUL 90					
24 2915 00 346 6488PT BELLOWS ASSY	0/0	2/2	35/35	42/32	125/97	13	238/208	0		EDD: BAL 236 EA, 50 EA PER MO TILL COMP, CONTRACT FOR 272 EA TO BEGIN 60 EA JUL 90 THRU OCT 90, 32 EA NOV 90, 153 EA ON PR INITIATED 06 NOV 89, MAX QTY ON CONTRACT - 1,139 EA
25 2915 00 352 3812PT LEVER FUEL	0/0	1/1	15/8	9/4	27/11	5	35/180	0		EDD: SHIPPED COMPLETE SA9G 271 EA ON CONTRACT TO START 75 EA JUL 90 - SEP 90, 46 EA - OCT 90 SA9G: SHIPMENT COMPLETE
					1 EA REC'D, 10 MAY 90					
					2 EA REC'D, 22 JUN 90					
26 3040 01 019 2895PT CAM CONTROL	0/0	1/1	14/14	8/6	25/19	13	29/258	0		EDD: OF 143 D/I: SAF2, 60 EA DUE MAY 90 & JUN 90, 43 EA DUE JUL 90 SAJ5 FOR 497 EA TO START 17 EA, JUL90 & 60 EA AUG 90 TILL COMPLETE.
					1 EA REC'D 08 MAY 90					
					14 EA REC'D 21 JUN 90					

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7

AS OF: 30 JUL 90

UFC PARTS CONSTRAINTS

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NSN	QTY-AWP 15/16	UPA	REPLX	MO	QTR	O/H	A/AX	B/O	REMARKS
27 2915 01 200 5287PT BRACKET	0/0	1/1	5/9	3/4	9/12	4	6/32	0	40 EA SATC: 4 EA DUE APR 90, 2 EA DUE MAY 90, 3 EA DUE JUN 90, 10 EA DUE JUL THRU SEP 90, 1 EA DUE OCT90 41 EA SABS: 7 EA DUE OCT 90, 10 EA DUE NOV 90 - JAN 91, 4 EA DUE FEB 91, 4 EA SHIPPED 30 JAN 90
28 2915 00 583 6279PT RESOLVER	0/0	1/1	15/24	9/11	27/33	21	40/541	0	94 EA DUE MAY 90 TILL COMPLETE BAL ON CONTRACT DUE IN 567 EA ON SA7W
29 2915 00 345 4299PT LEVER TRIM	0/0	1/1	9/6	5/3	16/8	2	24/168	0	EDD: 24 EA DUE MAY 90, 60 EA PER MO JUL - AUG 90, 15 EA DUE SEP 90, 57 EA ON PR WITH TOTAL CONTRACT MAX QTY OPT OF 302
30 2915 00 349 3308PT SHAFT CAM	0/0	1/1	56/67	33/31	100/92	14	201/795	0	EDD: SAK- 807 BAL DUE IN 155 EA DUE MAY 90, 175 EA DUE JUN 90 THRU AUG 90, 107 EA DUE SEP 90

5 EA REC'D APR 90
10 EA REC'D JUN 90
5 EA REC'D 11 JUL 90

11 EA REC'D MAY 90
17 EA REC'D, JUN 90
10 EA REC'D 23 JUL 90

091045

273
8

9.0

AS OF: 30 JUL 90

UFC PARTS CONSTRAINTS

NSN	QTY-AWP 15/16	UPA	REPLX	MO	QTR	REQT	O/H	A/AX	E/O	REMARKS
31 2915 00 346 6071PT SPOOL	0/0	1/1	10/11	6/5	18/15	1		32/98 0		172 EA ACCELERATED DEL SCHED, 31 APR 90 164 EA DUE IN: 41 EA DUE DEC 91 THRU APR 91 ON 90 2305.

091046

274
9

AS OF: 30 JUL 90

BUC PARTS CONSTRAINTS

NSN	QTY-AWP	UPA	REPLX	MO	REQT	QTR	O/H	A/AX	B/O	REMARKS
1. 2915 01 082 4015PT HOUSING	5	1	15	6	17	0	0/0	0/0	6	EDD: NO NEW STATUS; CONTRACT 27 EA ON CONTRACT DUE DEC 90, ALSO PR FOR 44 EA, HAMILTON STANDARD NEED PR# 90-60887, 05 FEB 90, 44 EA
										REC'D 1 EA 19 APR 90
										REC'D 1 EA 12 JUL 90

2. 5330 01 074 5434PT SEAL	2	10	100	367	1100	0	0/0	0/0	385	9,520 TO BE SHIPPED 15 AUG 90 FROM HAMILTON STANDARD
-------------------------------	---	----	-----	-----	------	---	-----	-----	-----	---

3. 5330 01 079 7306 PACKING	0	1	100	37	110	43	0/0	0/0	14	1,025 EA DUE EOM
--------------------------------	---	---	-----	----	-----	----	-----	-----	----	------------------

REC'D 32 EA, 05 JUL 90

AS OF: 30 JUL 90

AUGMENTOR PUMP CONTROLLER CONSTRAINTS

NSN	QTY-AWP	UPA	REPLX	MO	REQT	QTR	O/H	A/AX	B/O	REMARKS
1. 2915 00 279 5776PT HOUSING	25 AWP 30G	1	11	4	13	0	0/0	0/0	56	20 EA DUE SEP 90, 14 EA DUE OCT90, 20 EA DUE JAN 92, 13 EA DUE FEB 92. IM HAS 82 EA B/O, PRIORITY 1 - 8.

2. 2915 00 345 4020PT LEVER ASSY	9	1	5	2	6	0	0/0	0/0	14	50 EA ON REPAIR CONTRACT WITH BENDIX
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275
10

091047

User ID: L03

***** S T O C K N U M B E R D E E F

STOCK NUMBER: 2915010819644PT

26-JUL-90 13:14

* MIC CONTROL RECORDS:

STOCK NUMBER	MIC	SRC	UI	UNIT-COST	ERRC	ERZ	BIN-LOCATION	I&S	CRI
2915010819644PT	MFL	D	EA	176.11	N		0348FL01G017R	I	D

REC-STK	ON-ORDR	CNT-STDS	30D-REQ	Q1-REQ	Q2-REQ	Q3-REQ
6	0	3	20	18	28	1

* SUPPLY MASTER BALANCE:

STOCK NUMBER	ERRC	FUND	CRD	UNIT-COST	A-ACCT-BAL	AX-ACCT-BAL
2915010819644PT	N	6H	D	176.11	0	1309

* INTERCHANGEABLE OR SUBSTITUTE STOCK NUMBERS:

MASTER STOCK NUMBER	I & S CODE	LINK CODE	SUBSTITUTE STOCK NUMBER
2915004159916PT	I	ZZA	2915010819644PT
2915004159916PT	L	ZZB	2915004159916PT

* MANUFACTURE PART NUMBER RECORDS:

STOCK NUMBER	MFG PART NUMBER	NOUN/DESCRIPTION	FSMC	SOURCE	DA
2915010819644PT	2662762	SEAT AND SCREEN ASS	06848	M	

* MATERIAL STANDARD RECORDS:

STOCK NUMBER	MIC	PROD-NR	END-ITEM	OPER	RCC	OCC	UPA	SE
2915010819644PT	MFL	09767A	2915010645946PT	DEA01	MTPFAA	1.00	1	
2915010819644PT	MFL	12572A	2915012016783PT	DEA01	MTPFAA	1.00	1	
2915010819644PT	MFL	12600A	2915012037229PT	DEA01	MTPFAA	1.00	1	

User ID: L03

***** S T O C K N U M B E R D E E F

STOCK NUMBER: 2915010819644PT

26-JUL-90 13:14

BER DEEP LOOK *****

Page 1

R: 2915010819644PT

-90 13:14

ATION	I&S	CRD	D-I	DSM	ON-HAND	SUP-INT	MIC-INT	SPC-LVL	BCK-ORD
-------	-----	-----	-----	-----	---------	---------	---------	---------	---------

0017B	I	D	D	EC	1	0	0	0	5
-------	---	---	---	----	---	---	---	---	---

02-REQ	03-REQ	ISS-MTD	ISS-M1	ISS-M2	ISS-M3	ISS-M4	ISS-M5	ISS-M6
--------	--------	---------	--------	--------	--------	--------	--------	--------

28	1	3	2	0	2	6	2	2
----	---	---	---	---	---	---	---	---

AX-ACCT-BAL

1309

CK NUMBER

44PT

16PT

SOURCE	DATE-LAST-ACT
--------	---------------

B M	9035
-----	------

00C	UPA	REF %	CST-CD	UTL	30D-REQ	QTR1-REQ	QTR2-REQ	QTR3-REQ
-----	-----	-------	--------	-----	---------	----------	----------	----------

1.00	1	.03	A		3	5	20	0
1.00	1	.02	A		19	14	16	5
1.00	1	.03	A		0	0	0	0

BER DEEP LOOK *****

Page 1

R: 2915010819644PT

-90 13:14

091048

* BACK ORDER RECORDS:

STOCK NUMBER	MIC	UI	QTY	DOCUMENT NR	DS	PLDG	EDN	CON
2915010819644PT	MFL	EA	1	MTPMFL01623126		035117		
2915010819644PT	MFL	EA	4	MTPMFL01931363		035117		

* SUPPLY DUE INS:

STOCK NUMBER	SUP DUE-IN DOC NR	DUE-IN QTY	DUE-IN EDD	DUE-IN STATUS	DUE-IN DATE-LA	DUE-IN DTE-EST
2915010819644PT	01520364	6	1018	BB197	0193	0206
2915010819644PT	01930347	4	1018	BB197	0193	0206
2915010819644PT	01930348	4	1018	BB197	0193	0206

NOTE - SUPPLY ISSUES MAY NOT NECESSARILY BE ACCOUNTED TO THE MAINTENANCE

EDN	JON	PRI	ADV	OPC	CND	OPER	CBT	SEX	PROJ	DAYS-ON-BO
-----	-----	-----	-----	-----	-----	------	-----	-----	------	------------

		A3		A	A	1617B				43
		A3	BB	A	A	1617B				14

N	DUE-IN	SP	MAINTENANCE
A	DTE-EST	PR	DOC NR
	0206	12	MTPMFL01931363
	0206	12	MTPMFL01931363
	0206	12	MTPMFL01623126

O THE MAINTENANCE DOCUMENT NUMBER AS SHOWN

091049

020160

C/N	APPL	NOUN	STOCK NUMBER	IRQMT	PROD	PRO RATA	OWO	AWP	%
09676A	F100	UFC (F15) 23 631	2915 01 064 5946PT	8	3	2 51	0	0	150
				M	40	40	98	22	100
12572A	F100	UFC (F16) 18, 46, 87	2915 01 201 6783PT	8	4	2	2	0	200
				M	37	31	111	7	119
FY 90-4	EI/NEG	EI/ACCP	FAMILY TOTALS	16	7	4	2	0	175
	197	170		300	77	71	209	29	108
	103	130							

NSN NOUN P/N UPA REP% MONTHLY QTRLY QTY REQ QTY REQ SOS "G" COND AWP

(LINE *1) 2915 01 042 7831PT BODY METERING ✓ 2660537 1/1 6/6 3/3 10/8 FPZ 11/2 19/5
 (LINE *2) 2915 01 006 3031PT RCW VALVE BODY 2659364 1/1 3/4 2/1 4/3 FPZ 4/0 19/1
 (LINE *3) 4710 00 382 6759PT TUBE ASSY ✓ 2650680 1/1 10/10 6/5 18/14 FPZ 3/0 1/0
 (LINE *4) 2915 00 357 2503PT RETAINER ✓ 2652943 1/1 20/27 12/12 36/37 ? FPZ 0 0/0
 (LINE *5) 2915 01 021 3948PT VALVE ASSY ✓ 2660553 1/1 27/25 16/12 48/35 FPZ 0 0
 (LINE *6) 2915 01 259 7083PT ACTUATOR PISTON ✓ 2675530 1/1 5/40 3/18 9/55 FPZ 0 0
 (LINE *7) 2915 01 312 0777PT BODY 2675331 1/1 5/5 3/2 9/7 FPZ 0 0
 (LINE *8) 2915 01 042 7942PT DIST BODY ✓ 2660588 1/1 6/5 4/2 11/7 FPZ 0

PREPARED BY ENRIQUE SANCHEZ/EXT 54377

DATE: 23 JUL 90

PAGE 1

*Reflected material
will be condition
reflected material*

6121
11/01/00
11/01/00

120160

56290

055

56220

055

055

C/N	APPL	NOUN	STOCK NUMBER		RQMT	PROD	PRO RATA	OWO	AWP	%
12453A	F16	BACKUP CONTROL	2915 01 133 2467PT	E	4	1	1	0	0	100
FY90-4	EI/NEG	EI/ACCPT		M	110	25	27	37	4	93
	110	110								

091031

NSN	NOUN	P/N	UPA	REP%	MONTHLY QTY REQ	QTRLY REQ	SOS "G" COID	AWP
2915 01 082 4015PT	HOUSING	767500-3	1	15	6	7	FPZ	4
5330 01 074 5434PT	SEAL	69259-2	10	100	367	1100	FPZ	2
5330 01 079 7306	PACKING	M25988/2-031	1	100	37	110	FPZ	0

02520

C/N	APPL	NOUN	STOCK NUMBER	RQMT	PROD	PRO RATA	OWO	AWP	%
11759A	F100	AUGMENTOR PUMP CONTROLLER	2915 01 137 6551PT	10 M	1	2	0	0	50
FY 90-4	EI/NEG	EI/ACCPT		120	20	29	48	25	69
	120	120							

091032

NSN NOUN P/N UPA REP% MONTHLY QTY REQ QTRLY REQ SOS "G"COND AWP

2915 00 279 5776PT HOUSING 2653474 1 11 4 13 FPZ 25 25
 2915 00 345 4020PT LEVER ASSY 2651948 1 5 2 6 FPZ 9

*Contract
Logan?
50 each*

GINO Software calculations for EOQ w/ probability

MODEL:

```

1) H1 = 4.43 ;
2) H2 = 0.72 ;
3) P11 = 398.91 ;
4) P12 = 311.25 ;
5) M1 = 17 ;
6) M2 = 30 ;
7) ML1 = 161 ;
8) ML2 = 139 ;
9) SIG1 = 15.8569 ;
10) SIG2 = 14.0485 ;
11) C1 = 885.40 ;
12) C2 = 143.38 ;
13) MIN= C1 * M1 + H1 * ( R1 - ML1 + Q1 / 2 ) + ( H1 * ML1 / ( 2 * Q1 )
    M1 * P11 / Q1 ) * SIG1 * PSL( U1 ) + C2 * M2 + H2 * ( R2 - ML2 + Q2
    2 ) + ( H2 * ML2 / ( 2 * Q2 ) + M2 * P12 / Q2 ) * SIG2 * PSL( U2 ) +
    C3 * M3 + H3 * ( R3 - ML3 + Q3 / 2 ) + ( H3 * ML3 / ( 2 * Q3 ) + M3
    P13 / Q3 ) * SIG3 * PSL( U3 ) ;
14) U1 = ( R1 - ML1 ) / SIG1 ;
15) U2 = ( R2 - ML2 ) / SIG2 ;
16) C = 141367.68 ;
17) C1 * Q1 + C2 * Q2 + C3 * Q3 < 0.35 * C ;
18) H3 = 1.66 ;
19) P13 = 515.68 ;

```

--More--

```

2 ) + ( H2 * ML2 / ( 2 * Q2 ) + M2 * P12 / Q2 ) * SIG2 * PSL( U2 ) +
C3 * M3 + H3 * ( R3 - ML3 + Q3 / 2 ) + ( H3 * ML3 / ( 2 * Q3 ) + M3
P13 / Q3 ) * SIG3 * PSL( U3 ) ;
14) U1 = ( R1 - ML1 ) / SIG1 ;
15) U2 = ( R2 - ML2 ) / SIG2 ;
16) C = 141367.68 ;
17) C1 * Q1 + C2 * Q2 + C3 * Q3 < 0.35 * C ;
18) H3 = 1.66 ;
19) P13 = 515.68 ;

```

--More--

```

20) M3 = 78 ;
21) ML3 = 543 ;
22) SIG3 = 47.3937 ;
23) C3 = 331.12 ;
24) U3 = ( R3 - ML3 ) / SIG3 ;
25) R1 > 0 ;
26) R2 > 0 ;
27) R3 > 0 ;
28) Q1 > 0 ;
29) Q2 > 0 ;
30) Q3 > 0 ;

```

END

091053

SOLUTION STATUS: OPTIMAL TO TOLERANCES. DUAL CONDITIONS: UNSATISFIED.

OBJECTIVE FUNCTION VALUE

13) 45875.756357

VARIABLE	VALUE	REDUCED COST
H1	4.430000	.000000
H2	.720000	.000000
PI1	398.910004	.000000
PI2	311.250000	.000000
M1	17.000000	.000000
M2	30.000000	.000000
ML1	161.000000	.000000
ML2	139.000000	.000000
SIG1	15.856900	.000000
SIG2	14.048500	.000000
C1	885.400024	.000000
C2	143.380005	.000000
R1	219.719236	.003920
Q1	2.679855	1.812297
U1	3.703072	.000000
R2	168.687245	.101127
Q2	201.438334	.339731

--More--

U2	2.113197	.000000
C3	331.119995	.000000
M3	78.000000	.000000
H3	1.660000	.000000
R3	713.492353	-.101050
ML3	543.000000	.000000
Q3	55.036581	.804896
PI3	515.679993	.000000
SIG3	47.393700	.000000
U3	3.597363	.000000
C	141367.687500	.000000

ROW	SLACK OR SURPLUS	PRICE
1)	.000000	-60.071334
2)	.000000	-130.436640
3)	.000000	-.002570
4)	.000000	-.013048
5)	.000000	-885.460335
6)	.000000	-143.515380
7)	.000000	3.972492
8)	.000000	-.076618
9)	.000000	-1.761002
10)	.000000	-1.973715
11)	.000000	-17.000000

--More--

8)	.000000	-.076618
9)	.000000	-1.761002
10)	.000000	-1.973715
11)	.000000	-17.000000

--More--

12)	.000000	-30.000000
14)	.000000	7.249346
15)	.000000	11.189082
16)	.000000	.000000
17)	.004490	.000000
18)	.000000	-198.019866

091054

19)	.000000	-.002650
20)	.000000	-331.137512
21)	.000000	1.660867
22)	.000000	-.025931
23)	.000000	-78.000000
24)	.000000	-.042434
25)	219.719236	.000000
26)	168.687245	.000000
27)	713.492353	.000000
28)	2.679855	.000000
29)	201.438334	.000000
30)	55.036581	.000000

091055

MODEL:

```

1) H1 = 4.43 ;
2) H2 = 0.72 ;
3) PI1 = 398.91 ;
4) PI2 = 311.25 ;
5) M1 = 17 ;
6) M2 = 30 ;
7) ML1 = 161 ;
8) ML2 = 139 ;
9) SIG1 = 15.8569 ;
10) SIG2 = 14.0485 ;
11) C1 = 885.40 ;
12) C2 = 143.38 ;
13) MIN= C1 * M1 + H1 * ( R1 - ML1 + Q1 / 2 ) + ( H1 * ML1 / ( 2 * Q1 )
    M1 * PI1 / Q1 ) * SIG1 * PSL( U1 ) + C2 * M2 + H2 * ( R2 - ML2 + Q2
    2 ) + ( H2 * ML2 / ( 2 * Q2 ) + M2 * PI2 / Q2 ) * SIG2 * PSL( U2 ) +
    C3 * M3 + H3 * ( R3 - ML3 + Q3 / 2 ) + ( H3 * ML3 / ( 2 * Q3 ) + M3
    PI3 / Q3 ) * SIG3 * PSL( U3 ) ;
14) U1 = ( R1 - ML1 ) / SIG1 ;
15) U2 = ( R2 - ML2 ) / SIG2 ;
16) C = 141367.68 ;
17) C1 * Q1 + C2 * Q2 + C3 * Q3 < 0.35 * C ;
18) H3 = 1.66 ;
19) PI3 = 515.68 ;

```

--More--

```

2 ) + ( H2 * ML2 / ( 2 * Q2 ) + M2 * PI2 / Q2 ) * SIG2 * PSL( U2 ) +
C3 * M3 + H3 * ( R3 - ML3 + Q3 / 2 ) + ( H3 * ML3 / ( 2 * Q3 ) + M3
PI3 / Q3 ) * SIG3 * PSL( U3 ) ;
14) U1 = ( R1 - ML1 ) / SIG1 ;
15) U2 = ( R2 - ML2 ) / SIG2 ;
16) C = 141367.68 ;
17) C1 * Q1 + C2 * Q2 + C3 * Q3 < 0.35 * C ;
18) H3 = 1.66 ;
19) PI3 = 515.68 ;

```

--More--

```

20) M3 = 78 ;
21) ML3 = 543 ;
22) SIG3 = 47.3937 ;
23) C3 = 331.12 ;
24) U3 = ( R3 - ML3 ) / SIG3 ;
25) R1 > 0 ;
26) R2 > 0 ;
27) R3 > 0 ;
28) Q1 > 0 ;
29) Q2 > 0 ;
30) Q3 > 0 ;

```

END

:

091036

SOLUTION STATUS: OPTIMAL TO TOLERANCES. DUAL CONDITIONS: UNSATISFIED.

OBJECTIVE FUNCTION VALUE

13) 45875.756357

VARIABLE	VALUE	REDUCED COST
H1	4.430000	.000000
H2	.720000	.000000
PI1	398.910004	.000000
PI2	311.250000	.000000
M1	17.000000	.000000
M2	30.000000	.000000
ML1	161.000000	.000000
ML2	139.000000	.000000
SIG1	15.856900	.000000
SIG2	14.048500	.000000
C1	885.400024	.000000
C2	143.380005	.000000
R1	219.719236	.003920
Q1	2.679855	1.812297
U1	3.703072	.000000
R2	168.687245	.101127
Q2	201.438334	.339731

--More--

U2	2.113197	.000000
C3	331.119995	.000000
M3	78.000000	.000000
H3	1.660000	.000000
R3	713.492353	-.101050
ML3	543.000000	.000000
Q3	55.036581	.804896
PI3	515.679993	.000000
SIG3	47.393700	.000000
U3	3.597363	.000000
C	141367.687500	.000000

ROW	SLACK OR SURPLUS	PRICE
1)	.000000	-60.071334
2)	.000000	-130.436640
3)	.000000	-.002570
4)	.000000	-.013048
5)	.000000	-885.460335
6)	.000000	-143.515380
7)	.000000	3.972492
8)	.000000	-.076618
9)	.000000	-1.761002
10)	.000000	-1.973715
11)	.000000	-17.000000

--More--

8)	.000000	-.076618
9)	.000000	-1.761002
10)	.000000	-1.973715
11)	.000000	-17.000000

--More--

12)	.000000	-30.000000
14)	.000000	7.249346
15)	.000000	11.189082
16)	.000000	.000000
17)	.004490	.000000

091037

18)	.0000000	-198.019866
19)	.0000000	-.002650
20)	.0000000	-331.137512
21)	.0000000	1.660867
22)	.0000000	-.025931
23)	.0000000	-78.0000000
24)	.0000000	-.042434
25)	219.719236	.0000000
26)	168.687245	.0000000
27)	713.492353	.0000000
28)	2.679855	.0000000
29)	201.438334	.0000000
30)	55.036581	.0000000

:

091038

QRT TO DATE: 29 JUN 90

ITEM	QTR REQ	OWO BAL	MI CAP RQM PROD VAR
UFC-15	170	102	6 167 160 -7
09767A			
UFC-16	142	120	71 140 140 -0
12572A			

NOUN	STOCK NUMBER	P/N	F15	F16	PRTS REQ
RCVV VALVE BODY	2915-01-006-3031PT	2659364	19 +	1 =	20
PB STEEL RACK & PISTON	2915-01-259-7083PT	2675531	0 +	0 =	0
METERING VALVE BODY	2915-01-042-7831	2660537	22 +	14 =	36
TUBE PFIW	4710-00-382-6759PT	2650680	1 +	8 =	9
DISTRIBUTION BODY	2915-01-042-7942PT	2660588	0 +	0 =	0
RETAINER ASSEMBLY	2915-00-357-2503PT	2652943	6 +	3 =	9
LEVER & SHAFT MV	2915-00-357-2567PT	2654396	0 +	0 =	0
SPOOL	2915-00-346-6071PT	2649008	0 +	0 =	0
VALVE, SLIDE	2915-01-021-3948PT	2660553	0 +	0 =	0

=====

TOTAL PARTS NEEDED	48	26	74
--------------------	----	----	----

=====

F15 F16

TOTAL UFC'S AWP

ISSUES 74, 75, 76 IN HOUSE	9	+	9	=	18	F15	F16
MOH	10	+	2	=	12		
						27	+ 17 = 44

TCTO 538 A/W KIT	0	+	3	=	3
TCTO 538 A/W MEAS	0	+	1	=	1
TOTALS	19	+	15	=	34

TOTAL UFC'S	222	F15	=	102	F16 =	120
UNWORKABLE	34	F15	=	19	F16 =	15

=====

WORKABLE	188
----------	-----

=====

SAT 0

SAT/ADJ _____

M&I 11

RAR 8

ASI 16

091039

9.2
TRACKER II

The TRACKER system is an excellent start on a parts tracking system for F-100 UFCs but doesn't yet meet all the needs of production, scheduling, and planning for a tracking system. As a prototype, TRACKER has proven that a system such as this will work in the UFC area and that the data can be used to help various levels of management make good decisions.

The attached sheets describe a proposed version of an upgraded tracking system called TRACKER II. TRACKER II is designed to be; easy to use, cheap/easy to implement, and require no special equipment. It will use the same PC and database software used in TRACKER. The inputs to TRACKER II will be made by completing the input forms in this package. The forms will be turned in to the TRACKER II system clerk who will key punch the entries into the system. The data entry work will be performed on day shift. At about 14:30 each day, each supervisor should receive an updated copy of the SUPERVISOR'S DAILY WORKSHEET showing the latest data. On this schedule, the TRACKER II system will be updated every 24 hours. The only output described here is the daily report to production supervisors. Other reports to RCC management, scheduling, planning, engineering, etc. can be easily produced as required.

Chart #1 gives a simplified picture of the part/data flow through the RCC and how TRACKER II will track it. TRACKER II differs from TRACKER in certain aspects:

- TRACKER II does not collect data by employee number or in any fashion attempt to track the output of an individual.
- TRACKER II follows each serial number through the entire repair process, including the waiting times between operations. This gives supervisors a real picture of what parts are waiting and what they are waiting for. A part cannot be "lost" in the system.
- TRACKER II is designed to be schedule-driven. It is the first step towards producing a Just In Time (JIT) "pull" system that lets scheduling and production work together to get UFCs through the process as rapidly as possible.

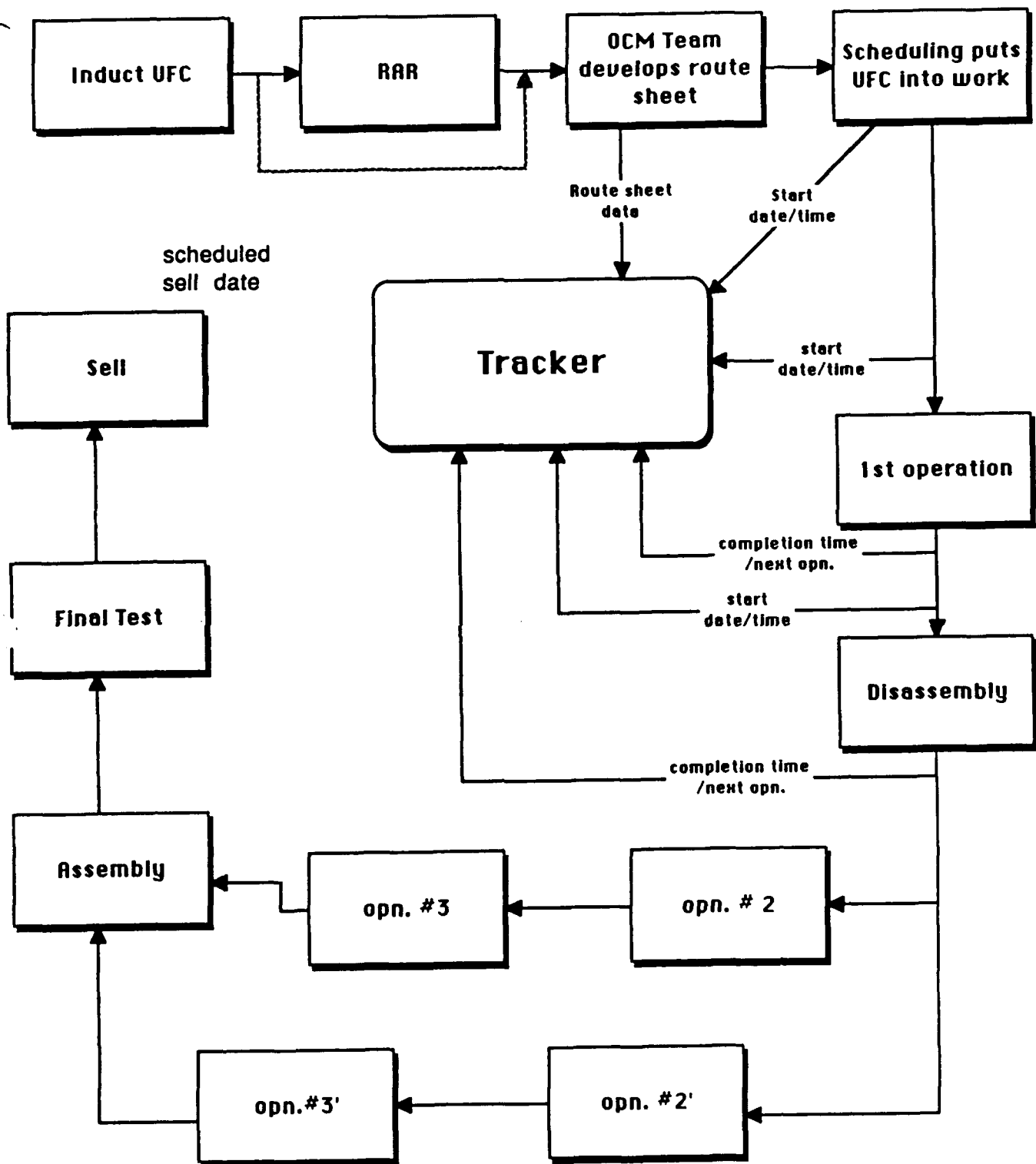
Implementing TRACKER II can be done one of two ways:

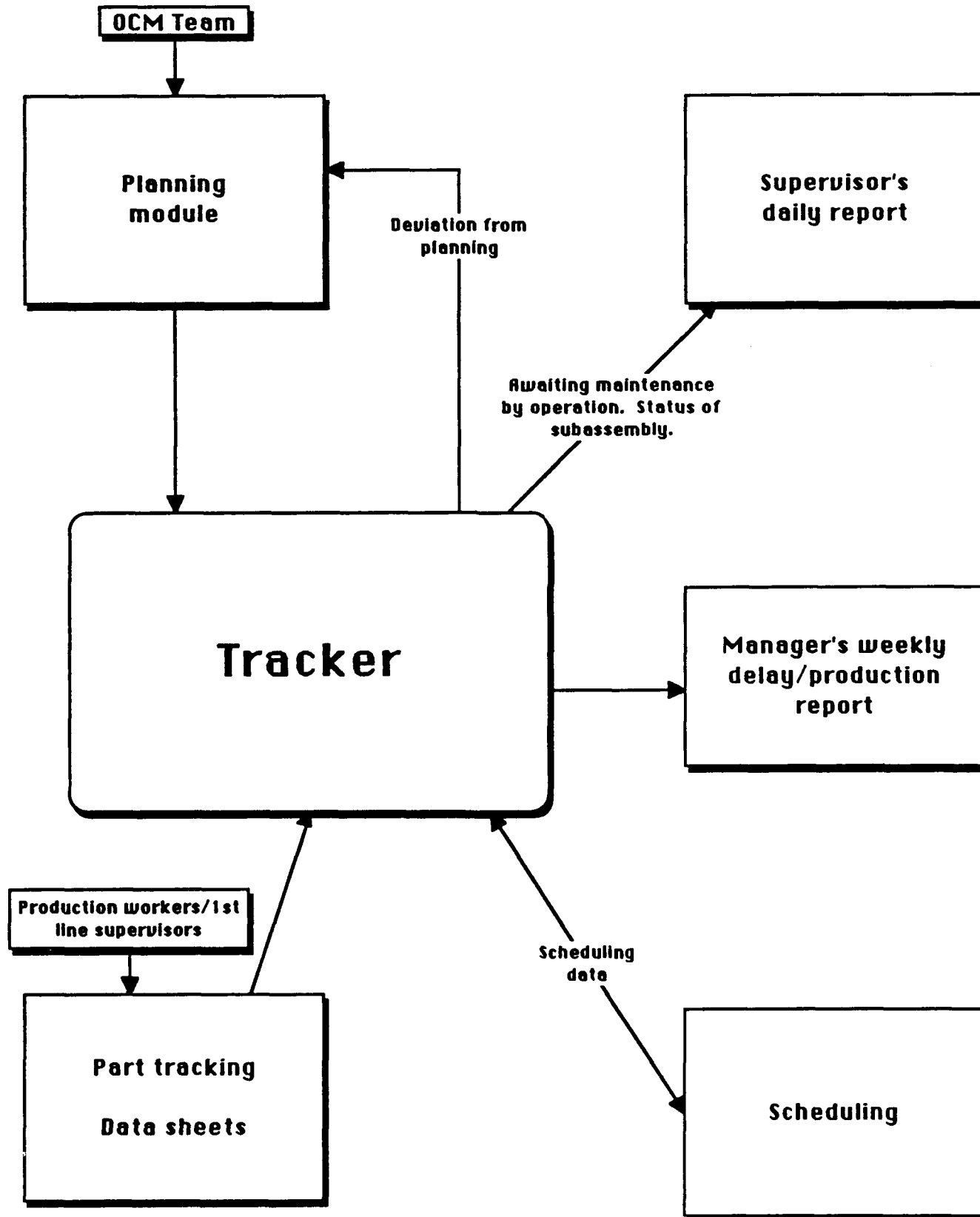
- 1) After the operation menu has been developed, the OCM team can begin producing Route sheets and loading S/Ns into the system as they are inducted. Scheduling can make their inputs off the Phase I Scheduling Worksheet, and production can fill out the Operation Input Sheets as they do the work. At first, the workload shown on the Supervisor's Daily Work Sheet will not be accurate. As older parts are repaired and leave the RCC,

and Incoming parts are entered into the TRACKER II system, the database will become more complete and the output sheets will become more complete and the output sheets will become accurate. Meanwhile, operation flowtimes will be captured and the database will be prepared for a scheduling transition to Phase II. This method will take several months to become fully operational but will not require any special effort to implement.

- 2) If method #1 takes too long, a special effort could be made to speed up implementing TRACKER II. An inventory audit could be performed where each UFC in the RCC (including those in AWP) would be identified, have a Route Sheet and Scheduling Worksheet developed for it, and be entered into the TRACKER II system. This would require extra labor hours but speed implementation.

Chart #2 shows the basic structure of TRACKER II and how it would serve various customers. The most important aspect of TRACKER II is that it will give all levels of management and support functions detailed visibility of the flow of parts through the system.





OPERATION INPUT SHEET

This is an input sheet. It is designed to let a craftsman or supervisor who performs an operation on a part tell the TRACKER system:

- What was done to the part.
- When it was done.
- How long it took.
- Where the part went after that.
- Any comments that might interest someone.

This sheet is the only input that production needs to make to TRACKER. When a part is sent to a given "Next Operation" it will appear on the next days SUPERVISOR'S DAILY WORKSHEET. The time written in the "COMPLETION TIME/DATE" block of the OPERATION INPUT SHEET will be the same time/date that appears in the "Date/Time Entered Queue" block on the DAILY WORKSHEET. If the craftsman/supervisor does not write in a next operation, the part will just go back into the queue for the current operation. The only way to get rid of a part is to give it to someone else! Parts can't be lost or pidgeonholed. If someone forgets to fill out an OPERATION INPUT SHEET, the part will just set in his queue until he remembers. His copy of the SUPERVISOR'S DAILY WORKSHEET will remind him each day of what is waiting in his queue. His boss will get weekly/monthly reports on the status of the various queues so everyone will have a picture of the situation.

This form is designed to track parts through the process. It does not track performance/time by operator.

SUPERVISOR'S DAILY WORK SHEET

This is an output sheet. It is designed to provide each supervisor with a daily "snapshot" of his/her current workload. This is a management tool for 1st line supervisors.

The daily worksheet tells the supervisor:

- How many (which) items are waiting for his operation(s).
- How long each has been waiting.
- Who sent him each part (in case he has questions).
- When scheduling wants the UFC to sell.
- What is the status of any sub assemblies.

This information allows the supervisor to determine at a glance:

- What workload he has to accomplish?
- Is he getting back logged?
- What is the priority on each part?
- Is the part on the critical path? (Is it worth working a part now if a sub assy won't be ready for months?)

The report will be sorted in order of "scheduled sell dates" which is priority order. If it were my job, I would draw a line through any parts which have sub assemblies delayed somewhere and then work the remaining parts in priority order. I would check off any that I complete and give the sheet to the next shift as a pass on log.

This report is not intended to tell each supervisor what parts to work. It is only designed to give the supervisors the data they need to plan their own work.

The "AVG TIME IN QUEUE" number is for a supervisor's information. This same number will be reported weekly/monthly to management so the supervisor should see it first. This way no one is ever surprised.

092007

SCHEDULING WORKSHEET

Phase I

This is an input sheet. It is intended to let scheduling set priorities by establishing sell dates. The sheet is designed to be very simple and require almost no analysis. The TRACKER system cannot currently provide adequate information to the schedulers to let them provide detailed scheduling to the production floor. As a result, the Phase I form will be used until scheduling feels comfortable using Phase II. The decision of when to begin Phase II should be made by the scheduling supervisor, not by production.

The "Scheduled Sell Date" should be figured using the average flowtime currently being experienced in the UFC process. This date will provide production with a rough "need date" and will drive basic prioritization in production. Scheduling can increase the priority of an item by moving up its Scheduled Sell Date. The "Scheduled Sell Date" is not a commitment to a customer, it is just the first step in setting up a "pull" system based on deliveries rather than the "push" system currently driven by inductions.

The MATE and DEMATE dates are to provide dates for the "Scheduled" block of the "Sub Assy Availability" section of the SUPERVISOR'S DAILY WORKSHEET. The "Estimated" block of the form will not be used while scheduling is in Phase I.

While using the Phase I sheet, scheduling does not need to try and update schedules for individual UFC's. That comes with Phase II.

092009

SCHEDULING WORKSHEET

UFC S/N: _____ F-15 ☐ F-16 ☐

Induction Date: _____

Scheduled Sell Date: _____ (Induction date + _____ days)

Scheduled Mate Date: _____ (Sell date - _____ days)

Scheduled Demate Date: _____ (Induct date + _____ days)

092010

SCHEDULING WORKSHEET
Phase II

This is an input sheet. It is designed to replace the Phase I version of the same name. It will allow scheduling to actually control the flow of parts through the production process. This form will only be used when TRACKER has acquired enough data to begin filling in "Estimated Avg Operation Flowtime".

The "Operation Number" Sequence comes from the OCM ROUTE SHEET, and is then updated when the part deviates from the Routing. The "Earliest Start Date" is frontward scheduled from induction using the Avg flowtime data. This entry for the "MATE" operation is the "Estimated Availability" entry on the "Sub Assy Availability" section of the SUPERVISOR'S DAILY WORKSHEET. Each Sub Assy will have its own scheduling worksheet.

The "Latest Start Date" is backward scheduled from the "Sell Date". The MATE entry in this column will provide the "Scheduled Sub Assy Availability" date on the SUPERVISOR'S DAILY WORKSHEET. The difference between "Earliest" and "Latest" entries is scheduling slack. Scheduling can raise the priority on a part and "take up the slack" by moving the sell date up in time.

The data from the OPERATION INPUT SHEET will tell scheduling:

- When the route has changed and new schedules are needed.
- How parts are doing against schedules.
- What is the avg flowtime across an operation.
- What is the avg process time (touch) across an operation.

With this data, scheduling can actually control delivery dates and "pull" parts through the production system.

092011

SCHEDULING WORKSHEET

F-15 ☐

F-16 ☐

UFC S/N: _____

Sub Assy S/N: _____

GG ☐

DB ☐

AC ☐

Induction Date: _____

Sell Date: _____

Operation Number	Earliest Start Time	Latest Start Date	Estimated AVG Operation Flow Time
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			
16.			
17.			
18.			
19.			
20.			
21.			
22.			
23.			
24.			
25.			
26.			
27.			
28.			
29.			
30.			
31.			
32.			
33.			

092012

OCM ROUTE SHEET

This is an input sheet. It is filled out after RAR (or on induction if RAR is not run) by the OCM team.

The list of possible operations and standard sequences are being developed by MDMSC and will be loaded to the TRACKER computer. The OCM team can either fill out a sheet by hand or go straight to the TRACKER computer and pick operations off a menu. If they use the TRACKER computer, it will automatically load the Route Sheet data to the TRACKER planning module.

One copy of the route sheet will stay with the OCM team and a second copy will travel with the UFC. If a demate is selected, enough copies of the route sheet will be printed to leave one for each sub assembly (normally 4 copies).

This route sheet is intended to provide initial routing for the part. It is not a directive. During the repair process, if a craftsman determines that a different operation is required, he/she will simply reflect the new "Next Operation" on the OPERATION INPUT SHEET and circle the entry to flag the system that the part has deviated from the initial routing.

When parts do deviate from their initial routing, a deviation report will be generated which will inform both the OCM team and scheduling that a change has occurred. The OCM team can use this information to improve their process. Scheduling can use the information to determine if the schedule should be changed.

OCM ROUTE SHEET

UFC S/N: _____

F-15 ☐

F-16 ☐

Opertion Number	GG S/N	DB S/N	AC S/N	Comments Indicate Mate/Demate
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				
16.				
17.				
18.				
19.				
20.				
21.				
22.				
23.				
24.				
25.				
26.				
27.				
28.				
29.				
30.				
31.				
32.				
33.				
34.				
35.				

NOTE: This Opertion Sequence Is Recommended by The OCM Team, but May Be Deviated From.

092014

TRACKER II

Date: _____

Work Area: _____

Item Being Worked:				Serial Num.	Task	Start Stop		Complete	Sent To Area:					
Unf	GG	ASI	AC			DB	Unf		GG	ASI	AC	DB		
								Y	N					
								Y	N					
								Y	N					
								Y	N					
								Y	N					
								Y	N					
								Y	N					
								Y	N					
								Y	N					
								Y	N					
								Y	N					
								Y	N					

Work Areas

- A. Unpack/Insp
- B. OCM Team
- C. RAR - 50002
- D. OCM Line
- E. GG Shop
- F. AC Shop
- G. DB Shop
- H. Accessories
- I. AWS
- J. ASI - 50002
- K. M&I/SAT - 50002
- L. 50004
- M. 50005
- N. Safety Wire
- O. AWP
- P. AWM

Z. Other (explain)

Accessories

Item Code		Qty Routed/Condemned		Item Code		Qty Routed/Condemned	
R	C	R	C	R	C	R	C
		R	C			R	C
		R	C			R	C
		R	C			R	C
		R	C			R	C
		R	C			R	C
		R	C			R	C
		R	C			R	C
		R	C			R	C
		R	C			R	C
		R	C			R	C
		R	C			R	C
		R	C			R	C
		R	C			R	C
		R	C			R	C

UFC PROCESS SHEET

UFC SN _____

AT STATION: _____

UFC ☐

GG ☐

AL ☐

DB ☐

(check one)

REPAIRABLE
ACCESSORIES
REPLACED:

① START TIME/DATE _____
STOP TIME/DATE _____

OPERATION _____

② START TIME/DATE _____
STOP TIME/DATE _____

operation _____

③ START TIME/DATE _____
STOP TIME/DATE _____

operation _____

④ START TIME/DATE _____
STOP TIME/DATE _____

operation _____

⑤ START TIME/DATE _____
STOP TIME/DATE _____

OPERATION _____

⑥ START TIME/DATE _____
STOP TIME/DATE _____

OPERATION _____

⑦ START TIME/DATE _____
STOP TIME/DATE _____

OPERATION _____

UFC SENT TO STATION: _____

GG SENT TO STATION: _____

AE SENT TO STATION: _____

DB SENT TO STATION: _____

092016
IF A PART IS SENT TO
STATION # 17 - OTHER,
PLEASE INCLUDE A BRIEF
DESCRIPTION OF THE ACTUAL
DESTINATION

ACCESSORY LOG SHEET

ACCESSORY _____ # _____

		PART COMPLETE?
		YES/NO
①	START TIME _____	_____
	STOP TIME _____	_____
②	START TIME _____	_____
	STOP TIME _____	_____
③	START TIME _____	_____
	STOP TIME _____	_____
④	START TIME _____	_____
	STOP TIME _____	_____

K

V

1111

STATIONS

- 1.) UNCRATE / RECEIVE
- 2.) OCM TEAM
- 3.) RAR
- 4.) INCOMING INSPECTION
- 5.) GG REPAIR
- 6.) DB REPAIR
- 7.) AC REPAIR
- 8.) OCM LINE
- 9.) 50004 TESTING
- 10.) 50005 TESTING
- 11.) ASI
- 12.) M+I / SAT
- 13.) Safety WIRE / SHIPPING PREP
- 14.) AWP
- 15.) AWM
- 16.) AWS (AWAITING MATE w/ SUB ASSY)
- 17.) OTHER (with description)

090018

TRACKER II

Work Area Cated

A	Unpack/Insp	J
B	OCM Team	K
C	RAR - 50002	L
D	OCM Line	M
E	GG Shop	N
F	AC Shop	O
G	DB Shop	P
H	Accessories	
I	AWS	Z

David J. M. Henderson

ACKER II

Start	Stop	Complete		Unf	Sent to Area:			
					GG	ASI	AC	DB
		Y	N					
		Y	N					
		Y	N					
		Y	N					
		Y	N					
		Y	N					
		Y	N					
		Y	N					

Work Area Categories:

A Unpack/Insp	J ASI - 50002
B OCM Team	K M&I/SAT - 50002
C RAR - 50002	L 50004
D OCM Line	M 50005
E GG Shop	N Safety Wire
F AC Shop	G AWPz
G DB Shop	P AWM
H Accessories	
I AWS	Z Other (Explain)

092019

UFC TRACKER

Operator ID #: _____

DATE: _____

[illegible]

Completion Status:

TC - Task Completed

TD - Delay

SO - Shift Over

MD - Management Decision

UF - UFC Failed Test

0920.0

STALLS

TASK DESC

- 1 AWAITING UFC ASSET
- 2 AWAITING MECHANIC-OPERATOR-CRAFTMAN
- 3 AWAITING TEST STAND
- 4 AWAITING OFF-SITE CONTRACTOR ACTION / SUPPORT
- 5 AWP STATUS
- 6 "G" CONDITION
- 7 AWAITING RETURN FROM MACHINE SHOP
- 8 WAITING RETURN FROM TESTING
- 9 STUDY / COMPLETE PAPERWORK / WCD
- 10 OTHER

FACILITIES

TASK DESC

- 11 CHILLED WATER FAILURE
- 12 ELECTRICAL POWER FAILURE
- 13 FIRE ALARMS AND FIRE DRILLS
- 14 OCM TEAM CONSIDERATION
- 15 SCHEDULING SECTION FUNCTIONS
- 16 SEARCH FOR / LOCATE PARTS
- 17 TOOL MONITORING DUTIES
- 18 SHOP AIR
- 19 HIGH PRESSURE AIR

TRANSFERS

TASK DESC

- 31 SEND / RELEASE GAS GENERATOR - GG
- 32 SEND / RELEASE ASI (AC W/DB)
- 33 SEND / RELEASE AUGMENTOR COMPUTER - AC
- 34 SEND / RELEASE DISTRIBUTION BODY - DB
- 35 SEND / RELEASE UFC TO BENDIX
- 36 SEND / RELEASE UFC TO MACHINE SHOP
- 37 SEND / RELEASE UNIFIED UFC
- 38 SEND / RELEASE ACCESSORIES / COVERS

ASSEMBLY

TASK DESC

- 71 REMATE AUG COMP TO DB
- 72 REMATE GAS GEN TO ASI
- 73 REPLACE EXTERNAL COVERS

INCOMING

TASK DESC

- 51 EXTERIOR CLEANING
- 52 ELECTRICAL SYSTEM TESTING
- 53 INTERNAL CONTAMINATION INSPECTION
- 54 VISUAL EXTERNAL & INTERNAL INSPECTION

OUTGOING

TASK DESC

- 91 OUTGOING ELECTRICAL TESTING
- 92 SAFETY WIRING
- 93 PRESERVATION, CAPPING, PLUGGING, & PACKING

MANPOWER

TASK DESC

- 20 CHECK TOOLS / TEST STAND
- 21 INJURY / MEDICAL
- 22 LEAVE
- 23 ON LOAN
- 24 TRAINING CLASS
- 25 MANDATORY GROUP MEETING
- 26 ASSIGNED SPECIAL PROJECT
- 27 GET HELP FROM MACHINE SHOP
- 28 ALTERNATE SUPERVISOR
- 29 PERSONAL DELAY

AUGMENTOR COMPUTER / OCM LINE

TASK DESC

- 201 TCTO S20
- 202 ISSUE CHANGE 46
- 203 ISSUE CHANGE 54
- 204 ISSUE CHANGE 62
- 205 ISSUE CHANGE 71 (14) .20 2 HRS
- 206 SLIDE VALVE → 10 HRS
- 207 TEMPERATURE RECEIVER
- 208 LOGIC BRACKET
- 209 PLA BRACKET
- 210 AJ LINK BRACKET
- 211 TRIM CENTERING BRACKET
- 212 RATIO BRACKET
- 213 OUTPUT BODY
- 214 Pb ACTUATOR
- 215 INSULATION
- 216 RESOLVERS (MN, PLA, or Pb)
- 217 SOLENOIDS
- 218 J23 HARNESS
- 219 J24 HARNESS
- 220 CONTAMINATION WORK
- 221 RUST WORK
- 222 LEVEL ONE & TWO UPGRADE PHYSICAL INSPECT
- 223 ISSUE CHANGE 65
- 224 ISSUE CHANGE 74
- 225 T2002Z
- 226 SWITCHES (AJ & IGNITION) → 3 HRS
- 227 ELECTRICAL CHECK
- 228 SOLDERING SOLENOIDS
- 229 TCTO 543
- 230 INSPECTION TABLE WORK
- 231 SAFETY WIRE AUGMENTOR COMPUTER
- 232 ASSEMBLE COMPUTER → 8-10 HRS

DISASSEMBLY

TASK DESC

- 41 REMOVE EXTERNAL COVERS 5 HRS
- 42 GAS GENERATOR DEMATING
- 43 AUG COMPTR DEMATING 1.5

DISTRIBUTION BODY

TASK DESC

- 601 SEGMENT VALVES (1-5)
- 602 ROTARY ACTUATOR
- 603 DUMP VALVES
- 604 SEQUENCING VALVE
- 605 FLOW DIVIDER (SPLITTER)
- 606 HEAD SENSOR
- 607 T2003Z
- 608 MANIFOLD FILL SENSOR / DIFFUSER
- 609 DISTRIBUTION BODY CHANGE
- 611 IGNITION TIMER
- 612 INLET FUEL FILTER
- 613 PRESSURING VALVE
- 614 SPHERICAL BEARING
- 621 LEVEL 1 MAINTENANCE
- 622 LOT 7 UPDATE
- 623 ISSUE CHANGE 77
- 624 Rust Work

9.3

BURST DISCS

MEMO

ICWD-275
13 August 1990

Subject: UNIFIED CONTROL TEST STANDS

To: Greg Gardner

CC: Jim Grounds (Kelly Air Force Base), Kent Schien (MDMSC)

Encl: (1) Cost Per Disk By Quantity in \$
(2) Material Compatibility of Hydrocarbon Fuels

From: Sean D. Crosby

1. I Recently completed a quick inspection of the Unified Control Test Stands located at Kelly Air Force Base in San Antonio, TX. I found the units to be quite good and considering that 49 units have been in operation for 10 years, I am sure that the Air Force is well aware of this fact. I do have a few observations that may be of help and interest.

2. The burst disk seems to add more than its share of down time to the program. Rupture of the disk may be occurring due to true over-pressurization. There is some indication this may happen if controls are not reset after a test is interrupted before completion. When the test is resumed, the surge may cause a rupture.

Another reason may be the type of burst disk being used. The disk in service now, made by Fike Metal Products, is an aluminum pre-bulged, rated at 250 psig. The tolerance on the burst pressure is + 10%, -5% and the recommended working pressure is 70% of burst. This puts the working pressure of the disk at 166.25 psig. The stands are commonly operated at 185 psig. This and the fact that pressure is cycled between 50 psig and 185 psig, more than 50 times during a test is causing the aluminum disk undue stress. A disk of monel is better suited for cycling. A nickle disk would also work but would be incompatible with JP-4 (see paragraph 4).

One other item on the disk is that its part number indicates that it is rated at 72°F. If it sees a higher temperature the burst pressure will be lower. During my short stay in San Antonio I was unable to determine what temperatures were involved.

None of the pre-bulged disks are rated at 80% of burst. To achieve this you can go to a scored disk which is the only other disk made by Fike which can fit into the present type BU burst disk holder.

The scored disks are more expensive. You will have to determine the amount of down time caused and the time involved in replacing a disk that has ruptured to determine cost savings. Enclosure (1) is a chart of costs per quantity and type of disk.

090001

02330-1

POZ TSW HSWT1-C CSWDW 64:21 06. 41 004

ICWO-275
13 August 1990

-2-

3. One change that would save time during set-up would be to use quick-disconnects (QDS) at the 20 separate 1/4 inch hose connections of the Unified Fuel Control (UFC). The time involved to connect a swivel nut fitting and torque it properly is approximately one minute (k.f. MDAC Standard Data C1.21.4.2 and C1.21.24.35). Utilizing quick disconnects should save about 19 minutes per test. Attaching the QDS to the UFC will take no longer than the 370 flare fittings now used.

4. Last I would like to offer a word of caution. I was told that JP-4 would soon be replacing soldered solvent as the test fluid. JP-4 is not compatible with brass, nickle, zinc or bronze (see Enclosure (2)). The following item numbers from the test stand drawings contain theses materials: 33, 40, 102, 103, 524, 539, 547, 580, 635, 636, 651, and 658. There are more but this is a representative list. It also needs to be verified which of these actually come into contact with fuel.

5. If you have any questions or if you have another task that I can be of help with, please let me know.

Sean D. Crosby
Principle Specialist Engineer
MDMSC-STL, 314-233-0077

SDC:dal

ENCL. (2)

2.3 MATERIAL COMPATIBILITY

Materials selection for use with hydrocarbon fuels is required in the design of equipment and the aircraft and engine fuel system. Noncompatible metals can cause degradation of the fuel, while the fuel may attack nonmetals and gaskets to cause failure of function as well as degrading the fuel itself.

3.3.1 Metals

The following lists categorize metals that are satisfactory for use with hydrocarbon aircraft and missile fuels, and those that are not recommended:

<u>Satisfactory</u>	<u>Unsatisfactory</u>
Aluminum and all its alloys	Bronze
Carbon Moly Steel	Nickel
1/2 to 3% Ni Steel	Copper
4 to 6% Chr. Moly Steel	Zinc
300 Series Stainless Steel	Cadmium
400 Series Stainless Steel	Brass
Monel	

3.3.2 Packing and Gasket

The following materials are recommended for use for packing and gasket applications with aircraft and missile hydrocarbon fuels:

Nylon	Fluorothene A
Kel-F	Vynlite
Trithene	Teflon
Polyethylene	Fluorel
Buna N (linear compound MJ-70) for JP-4, JP-8 only	Viton

The choice of material depends upon the temperature level of the application.

3.3.3 Lubricants

Lubricants used in conjunction with fuel system components such as pumps and controls may come in contact with the fuel being transferred. The following lubricants are recommended for use in fuel systems handling aircraft and hydrocarbon missile fuels:

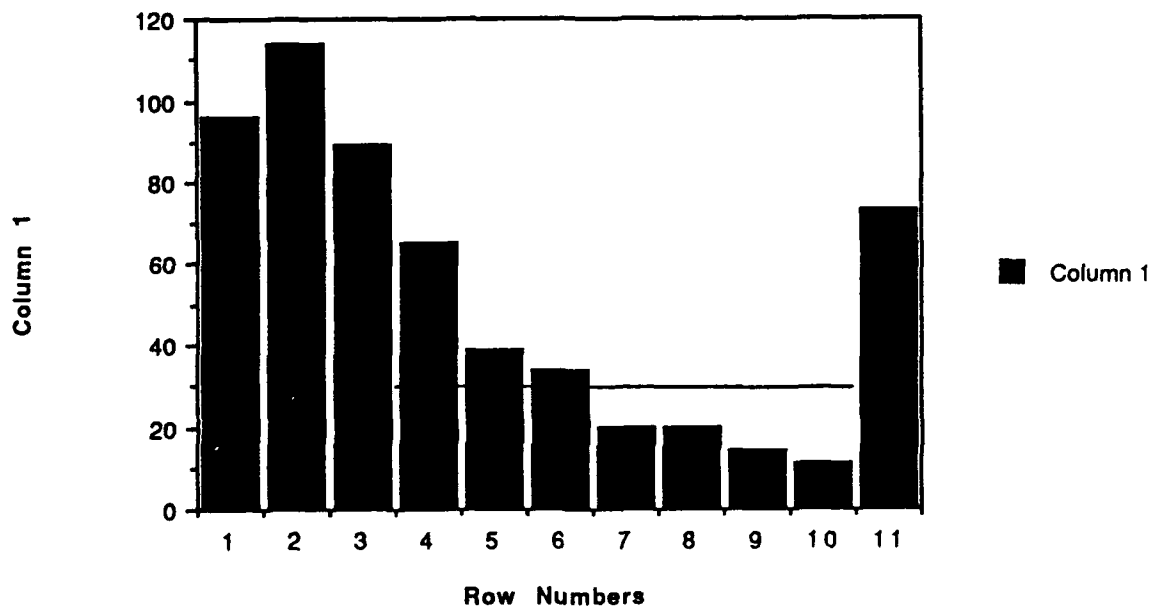
Molykote
Fluorolubes

MIL-G-6032 Grease
Electrofilm Graphite Coating

~~WATERPROOFING~~
ALSO → MIL-G-27617E
(NOT ON ALUMINUM)
IN BENZINE

MIL-G-6032 IS GOOD FOR FUEL SYSTEMS
AND OXYGEN SYSTEMS

Data from "BURST DISK FAILURE DATA"



090094

23
 21
 13
 12
 8
 21
 22
 9
 18
 9
 17
 32
 13
 24
 8
 14
 16
 23
 5
 8
 23
 4
 15
 15
 7
 9
 10
 9
 11
 3
 4
 3
 15
 10
 16
 12

24
 15
 16
 14
 8
 5
 8
 21
 16
 3
 2
 2

48 stands

$$\bar{x} = 12.8$$

$$\sigma = 7.09$$

4511

✓

09/11/89 (in)	132	40
19/12/89 (Gene Brown No. 2.0 used)	172	35
23/01/90	207	9
01/02/90 (in)	216	4
05/02/90	220	16
21/02/90	236	9
02/03/90	245	2
05/03/90	247	17
21/03/90	264	21
4/4/90 4/12/90 inside	285	0
11/04/90 (05:46) }	285	76
11/04/90 (09:31) }	361	2
28/06/90 (01:35) }	363	(C)
29/06/90 (13:13) }	364	C
29/06/90 (15:08) }	364	(C)
30/06/90 (06:15) }	365	

4462

✓

7/13/89

9/14/89

9/15/89

10/24/89

2/2/90

2/6/90

2/9/90

2/13/90

(U.S.S.)

2/13/90

(15:32)

3/18/90

①

②

③

13

1

63

76

1

1

77

1

39

116

1

101

217

1

7

224

1

4

228

1

0

228

2

33

261

1

090067

4471

✓

14/9/89 (both)
20/01/90
31/01/90 (CUT)
13/02/90
18/03/90
10/6/90 2 risks

①	②	③
76	1	128
204	1	11
215	1	13
228	1	5
233	1	

4468

26/7/89 (B10 RUPTURED)
 18/9/89
 02/10/89
 12/10/89
 18/10/89
 31/10/89 (N HVD) (06:56)
 01/11/89 (08:17)
 04/12/89 (in)
 02/02/90 (in)
 10/02/90
 05/03/90
 07/03/90 (in)
 12/04/90 (PFB B10)
 15/06/90 (Pump But)
 20/06/90

✓

(1)	(2)	(3)
26	1	54
30	1	14
94	1	10
104	1	6
110	1	13
123	1	1
124	1	33
157	1	60
217	1	14
231	1	17
248	1	2
250	1	38
282	1	73
361	1	

092069

4510

✓

9/8/89	enter		
12/8/89	(inside T/s)	43	10
22/8/89	(needs B/D)	53	57
18/10/89		110	2
19/10/89	2	112	0
20/10/89			
20/10/89	(inside)	(09:08)	
21/10/89		(14:14)	
26/10/89	(2)	(01:41)	
27/10/89		(11:26)	
14/11/89		(07:03)	
14/11/89		(11:38)	
14/11/89		(11:46)	
14/11/89			
20/11/89		(12:22)	
21/11/89		(07:27)	
22/11/89		(07:20)	
06/12/89	(needs B/D)	(03:34)	
07/12/89	" "	(03:08)	
15/12/89		(00:04)	
15/12/89		(00:54)	
22/12/89	(needs B/D)		
22/12/89			
10/04/90			
16/05/90			

	43	10
	53	57
	110	2
	112	0
	112	0
	113	0
	118	0
	119	0
	137	0
	137	0
	139	0
	143	0
	144	0
	145	6
	157	1
	160	8
	168	0
	168	11
	177	34
	213	71
	284	

090010

14461



	①	②	③
18/7/89	18	1	1
19/7/89	19	2	22
10/8/89	41	1	66
15/10/89	107	1	6
21/10/89	113	1	76
5/1/90 (Inside)	189	1	4
9/1/90 +1	193	1	23
1/2/90 (2 disks) (11:38)	216	2	0
1/2/90 (21:37)	216	2	37
10/3/90	253	1	19
29/3/90	272	1	13
3/4/90	285	1	6
11/4/90	291	1	5
17/4/90	296	1	2
22/4/90	298	1	1
24/4/90 (Regulator problem)	299	2	15
25/4/90	314	1	15
10/5/90	329	1	
25/5/90			

090011

14458

✓

19/7/89
18/8/89
28/8/89
21/9/89 3?
22/9/89 3?
3/11/89
7/11/89 (01:20)
7/11/89 (08:01)
2/12/89
11/12/89 (5:51)
12/12/89 (Inside) (13:18)
6/1/90
10/3/90
13/3/90 (Inside) (6:41) ?
14/3/90 (2:07) 3?
22/4/90
3/4/90
20/4/90
12/5/90
22/5/90
3/6/90
16/6/90
21/6/90
~~WTF/1/90~~

①	②	③
19	1	
		40
59	1	
		24
83	1	
84	2	1
		42
126	1	4
130	1	0
130	2	
		25
155	1	9
164	1	1
165	1	
		25
190	1	66
256	1	1
257	2	
		19
276	1	6
282	1	
294	1	12
		22
316	1	8
324	1	
		14
338	1	13
351	1	5
356	1	

09C012

4460



30/7/89
 31/7/89
 20/8/89 (inside)
 22/10/89
 15/11/89
 09/10/190
 26/10/190
 23/12/90 - inside
 09/05/190
 23/06/190 (NEEDS BLOS)
 27/06/190 (OUT)

①	②	③
31	1	20
51	1	63
114	1	22
136	1	57
193	1	17
210	1	103
313	1	45
358	1	4
362	1	

4477

✓

28/8/89 (inside)

05/9/89

2/11/89 outside

01/03/89

20/2/90 outside

05/06/90 (17:42)

05/06/90 (20:30)

05/06/90 (23:05)

17/06/90 (CCT)

⑪

②

③

59

1

3

67

1

177

244

1

96

340

1

0

340

2

0

340

3

14

354

1

090014

4469

03/8/89
 18/8/89 (I40)
 24/8/89
 02/10/89
 20/11/89 (222)
 27/11/90 outside
 11/02/90
 30/02/90
 07/03/90 (in)
 27/03/90
 12/04/90
 15/04/90
 21/05/90 (iv)
 27/05/90 (20:52)
 24/06/90 (11:25 510) (11:25)
 04/06/90
 11/06/90 (out) (09:12)
 11/06/90 (in) (16:47)

✓

(1)	(2)	(3)
34	1	15
49	1	45
94	1	49
143	1	83
226	1	15
241	1	9
250	1	22
272	1	14
286	1	6
292	1	33
325	1	2
327	1	1
328	2	11
339	1	7
346	1	0
346	2	

090015

4466

17/7/89
22/7/89

21/8/89
29/8/89

10/9/89
14/9/89 (Inside + out)

29/9/89

2/10/89
6/10/89
11/10/89 (3:08) } ?
11/10/89 (15:10) } ?
16/10/89 (Inside) +1
31/10/89

28/11/89

24/1/90 (Inside)
29/1/90

23/2/90 (3:54)
24/2/90 (11:08)

7/3/90
31/3/90

2/5/90
4/5/90

2/6/90
14/6/90
25/6/90 (Inside)

✓

(1)	(2)	(3)
22	1	
		30
52	1	8
60	1	12
72	1	4
76	1	15
91	1	3
94	1	4
98	1	5
103	1	0
103	2	5
108	1	15
123	1	29
152	1	56
208	1	5
213	1	25
233	1	1
239	1	11
250	1	24
274	1	32
306	1	2
308	1	29
337	1	12
349	1	11
360	1	

090016

4463



13/7/89

19/2/89

1/8/89
14/8/89 Inside

~~10/8/89~~

14/10/89

30/10/89

2/11/89

14/11/89

15/11/89

30/11/89

14/12/89

14/12/89

15/3/90

15/3/90

13/04/90

12/5/90

30/5/90

31/5/90

~~(64:12)~~

~~(64:12)~~ (04:04)

(64:12)

① ② ③

13	1	
19	1	6
32	1	13
105	1	73
106	1	1
122	1	16
125	1	3
137	1	12
138	1	1
153	1	15
167	1	14
258	1	91
258	2	0
287	1	29
316	1	29
334	1	18
335	1	1

09C017

4476



19/7/89 (2 disks)

22/7/89

24/7/89

11/8/89

16/8/89

23/8/89

25/8/89

5/11/89

22/11/89 + 1

1/12/89

18/1/90 ??

19/1/90 3

23/1/90 (17)

~~24/1/90~~

25/1/90

21/6/90

①

②

③

19

1

22

1

3

24

1

2

42

1

18

47

1

5

54

1

3

56

1

2

128

1

72

145

1

17

154

1

4

202

1

48

203

2

1

207

1

4

223

1

16

356

1

133

14506



16/7/89		16	2
18/7/89	(Inside)	18	13
31/7/89	(outside)	31	27
27/8/89		58	22
18/9/89		20	8
26/9/89		88	28
24/10/87		116	9
2/11/89	(16:57)	125	0
2/11/89	(22:18)	125	64
6/11/89	2	189	27
5/1/90	(Inside)	216	46
1/2/90		262	74
14/3/90		336	11
1/6/90	(Inside)	347	
12/6/90			

090019

4470



		①	②	③
20/7/89	(9:04) } ?	20	1	1
21/7/89	(17:11) }	21	1	6
27/7/89	(Inside)	27	1	15
11/8/89		42	1	18
27/8/89	(3:02) } ?	60	1	0
27/8/89	(9:03) }	60	2	0
29/8/89	(19:00) }	60	3	14
12/9/89		74	1	6
18/9/89		80	1	10
20/9/89	← 27/9/89 outside (10:54)	90	1	24
22/10/89	(Inside) (11:06) }	114	1	0
22/10/89	(13:43) }	114	2	0
22/10/89	(15:02) }	114	3	86
26/10/89	- 2			
16/1/90		200	1	24
9/2/90		224	1	4
13/2/90	(2:12) } ?	228	1	0
13/2/90	(5:10) }	228	2	10
23/2/90		238	1	4
27/2/90		242	1	23
22/3/90	(Inside + Out)	265	1	39
30/4/90		304	1	33
2/6/90		337	1	5
7/6/90		342	1	

0900.0

4479

✓

04/8/89 (Both)	35	10
14/8/89	45	3
17/8/89	48	2
19/8/89 (inside)	50	31
19/9/89		
25/10/89	81	44
03/11/89 (needs B10)	125	70
11/01/90 (" ")	195	49
01/03/90 (needs B10)	244	32
02/04/90 (B10 needs 2)	276	86
27/06/90	362	

09C021

4509

✓

11/8/89	42	25
07/9/89 (needs Bld)	69	6
13/9/89	75	6
19/9/89 (00:04)	81	0
19/9/89 (12:27)	81	79
18/10/89	160	51
07/10/89 (needs Bld)	211	11
27/10/190	222	
07/102/90		

44-75

✓

		①	②	③
14/7/89		14	1	
11/8/89	(2 disks)	42	2	28
3/10/89	outside			44
13/11/89		136	1	
15/11/89		138	1	2
16/11/89	(4 disks)	139	4	1
13/12/89		166	1	27
21/1/90		205	1	39
23/1/90	(multiple w/ 75 p.ols) (01:06)	207	2	2
23/1/90	15:16	207	3	0
23/1/90	15:51 (Inside)	207	4	0
27/1/90		211	1	4
26/2/90		241	1	30
5/3/90		248	1	7
27/3/90		270	1	22
30/4/90		304	1	34

090023

4489

✓

14/9/89	76	8
22/9/89 (out) + In	84	57
18/11/89	141	12
30/11/89	153	56
25/12/89	209	9
03/02/90	218	5
28/02/90	223	33
13/03/90 (needs BID)	256	36
18/04/90 (BID / PFLB PROBLEM) (cc. 11)	292	0
18/04/90 (15.55)	292	19
07/05/90	311	49
20/06/10	360	

090024

14465



20/7/89
 24/7/89
 1/8/89 outside 16:08
 1/8/89 (outside) (10:03) } ?
 1/8/89 (17:05) }
 3/8/89
 10/8/89
 25/8/89
 15/9/89
 3/11/89 (inside) (4:51)
 4/11/89 (22:53)
 16/11/89 (needs B10)
 20/11/89
 30/4/90
 12/6/90

①	②	③
20	1	4
24		8
32	1	0
32	2	2
34	1	7
41	1	15
56	1	70
126	1	1
127	1	12
139	1	4
143	1	161
304	1	47
351	1	

090025

43574

✓

(1) (2) (3)

15/7/89	(Inside)	15	1	5
20/7/89		20	1	28
17/8/89		48	1	5
22/8/89		53	1	30
21/9/89		83	1	21
12/10/89		104	1	82
2/1/90		186	1	
3/1/90	(Inside)	187	1	1
				50
22/2/90 }	(03:44)	237	1	
22/2/90 }	(00:48)	237	2	
				3
25/2/90		240	1	
				8
5/3/90		248	1	
				4
9/3/90		252	1	
				2
11/3/90	(Inside)	254	1	
				9
20/3/90	(Inside)	263	1	
				10
30/3/90		273	1	
				7
6/4/90		280	1	
				36
12/5/90		316	1	
14/5/90		323		7
23/5/90	(Inside)	323 3271		5
				17
9/6/90		344	1	
15/6/90		350	1	6
20/6/90		355	1	5

090016

✓

14358

18/7/89	(outside)	(11:00)
18/7/89		(15:20)
28/8/89		
29/8/89	(Inside)	
11/9/89	(Inside)	
16/9/89		
25/9/89		
11/10/89		
13/10/89		
20/10/89		
24/10/89		
19/12/89	(Inside)	
12/1/90		
30/1/90		
1/2/90		
5/2/90	(Inside)	
15/03/90		
24/4/90		
25/4/90	(Inside)	
7/5/90		
22/6/90		

✓

	①	②	③
18	1		
18	2		
			41
59	1		1
60	1		13
73	1		5
78	1		9
87	1		
			16
103	1		2
105	1		7
112	1		4
116	1		
			56
172	1		
			24
196	1		18
214	1		2
216	1		4
220	1		38
258	1		40
298	1		!
299	1		
			12
311	1		
			46
357	1		

090027

4360



15/9/89	
05/10/89	
26/10/89	(in)
01/11/89	(in)
21/11/89	(14:07)
21/11/89	(16:10)
21/11/89	(21:21)
25/01/90	(00:03)
26/01/90	(01:22)
29/01/90	(17:01)
29/01/90	(20:55)
31/01/90	
02/02/90	

①	②	③
77	1	20
97	1	21
118	1	2
124	1	20
144	1	0
144	2	0
144	3	65
209	1	1
210	1	3
213	1	
213	2	2
215	1	2
217	1	

090013

436/

✓

7/13/89
8/1/89
10/16/89
10/23/89
11/04/89
11/20/89
1/19/90
2/22/90
4/11/90
4/12/90
5/14/90
5/18/90

①	②	③
<u>Days</u>		
13	1	19
32	1	76
108	1	7
115	1	12
127	1	16
143	1	60
203	1	34
237	1	48
285	1	1
286	2	32
313	1	4
322	1	

12 Bust Disks

$$\bar{X} = 28.1$$

$$\sigma = 23.4$$

090619

4362

22/7/89
28/8/89
7/11/89
18/1/90
26/1/90
13/2/90
10/4/90 (Inside + out)
12/5/90

✓
① ② ③
22 1
59 1 37
130 1 71
202 1 72
210 1 8
~~228~~ 18
228 1
~~228~~ 56
284 1 32
316 1

090050

4459



17/7/89
 30/7/89

 25/8/89
 19/9/89
 5/10/89
 6/10/89
 12/10/89
 14/10/89
 27/11/89
 3/2/90
 10/2/90
 10/2/90

 5/3/90
 6/3/90
 7/3/90

 16/4/90

 6/5/90
 22/5/90
 30/5/90

 5/6/90
 9/6/90
 14/6/90

(15:46) } ?
 (15:46) } ?

(Inside)

(Outside)

①	②	③
17	1	13
30	1	26
56	1	25
81	1	16
97	1	1
98	1	6
104	1	2
106	1	44
150	1	68
218	1	7
225	1	0
225	2	23
248	1	1
249	1	1
250	1	40
290	1	20
310	1	16
326	1	8
334	1	6
340	1	4
344	1	5
349	1	

090051

4464

08/8/89 (inside) (15:54)
 08/8/89 (21:52)
 09/8/89 (19:31)
 14/8/89 (inside)
 30/8/89 (in-out)
 15/9/89 (out) (11:08)
 16/9/89 (02:59)
 04/10/89 (10:08)
 04/10/89 (11:53)
 06/10/89 (08:26)
 06/10/89 (09:33)
 14/10/89 (needs B/D)
 20/10/89 (in)
 16/11/89
 22/11/89 (PFCB busting B/D)
 02/12/89
 18/12/89
 26/12/89 (needs B/D)
 13/12/90
 01/02/90 (03:17)
 01/02/90 (04:00)
 11/02/90 (11:00)
 07/03/90
 14/03/90
 16/03/90 (10:13)
 16/03/90 (22:01)
 23/03/90 (WIT STAND PK'D FLOW)
 (DBL INSIDE B/D)
 26/04/90
 07/05/90
 11/05/90
 09/06/90
 11/06/90

✓

(1)	(2)	(3)
39	1	0
39	2	1
40	3	5
45	1	16
61	1	16
77	1	1
78	2	18
96	1	0
96	2	2
98	1	0
98	2	8
106	1	10
116	1	23
139	1	6
145	1	10
155	1	16
171	1	8
179	1	17
196	1	20
216	1	0
216	2	1
217	3	33
250	1	7
257	1	2
259	1	0
259	2	12
271	2	27
300	1	11
311	1	18
329	1	10
339	1	12
351	1	

090032

4467

✓

①

②

③

30/8/89

61

1

17

16/9/89

78

1

11

27/9/89

89

1

141

15/02/90

230

1

5

20/02/90

235

1

4

24/02/90 (in)

239

1

60

25/04/90 (in)

299

1

43

07/06/90 (in)

342

1

090033

4410

34100/10

46 49 -

12/18/89

090034

4472

27 / 7 / 89 (inside)
14 / 8 / 89
04 / 01 / 90 (needs 610)
24 / 01 / 90
08 / 02 / 90
07 / 03 / 90 (21:41)
05 / 03 / 90 (in) (20:22)
10 / 06 / 90

	✓	
①	②	③
27	1	18
45	1	148
193	1	15
208	1	15
223	1	27
250	1	1
251	1	100
351	1	

4493

✓

02/8/89 (15:02)
 03/8/89 (09:53)
 18/8/89
 29/8/89
 31/8/89
 14/9/89 (in)
 22/9/89
 24/9/89 (in)
 27/9/89 (21:08)
 27/9/89 (21:21)
 06/10/89
 27/12/89 (note 810)
 22/01/90
 22/02/90
 14/02/90
 01/03/90
 20/03/90
 20/03/90
 20/03/90
 22/05/90
 12/06/90
 22/06/90
 23/06/90 (in)

(1)	(2)	(3)
33	1	1
34	2	15
49	1	11
60	1	2
62	1	14
76	1	8
84	1	2
86	1	3
89	1	6
89	2	9
98	1	82
180	1	26
206	1	11
217	1	12
229	1	15
244	1	19
263	1	6
269	1	53
322	1	4
326	1	21
347	1	14
361	1	2
363	1	

090000

4474

✓

05/8/89 (inside)

13/11/89

23/01/90

22/02/90

①

36

136

187

237

②

1

1

1

1

③

100

49

50

090057

4478

07/01/90		191	18
25/01/90		209	12
06/02/90	(22:10)	221	11
07/02/90	(10:21)	222	19
20/02/90		241	73
10/05/90	(B10 Reset Computer)	314	2
12/05/90		316	2
14/05/90	(IN)	318	10
24/05/90		328	

093038

4480

N

25/7/89

31/7/89

29/8/89 (I+0)

26/9/89

22/10/89

06/11/89

15/11/89

21/11/89

24/01/90 (needs 810)

27/05/90

25

~~31~~

31

(2) 60

88

114

129

138

144

203

333

2

6

29

28

26

15

9

6

64

125

090059

4482

✓

7/13/89	
7/14/89	
7/26/89	
9/9/89	
12/1/89	
12/13/89	
1/24/90	
3/20/90	? (03:24)
3/20/90	(2:01)
6/20/90	(14:58)
6/20/90	(20:13) outside

13	1
14	12
26	45
71	83
154	12
166	42
208	55
263	c
263	92
355	c
355	

11 Burst Disks

$\bar{X} = 34.2$ days

$\sigma = 32.8$

090040

4483

✓

03/10/89

59/10.2/90 (cut)

15/10.5/90

~~22/10.5/90~~

95

127

224

95

319

090011

4484

✓

08/11/89
15/12/89
21/02/90 (02/10) }
22/02/90 (21/00) }

131	1	37
168	1	68
236	1	1
237	2	

4485

08/12/89

02/02/90

13/03/90

161

217

256

56

39

090043

4/4 SL

✓

13/11/89	(14.44)	136	0
13/11/89	(17.15)	136	0
13/11/89	(23.14)	136	0
14/11/89	(00.45)	137	0
08/01/90		192	3
11/01/90	(in)	195	25
05/02/90		220	26
03/03/90	(in)	246	23
20/03/90		269	15
10/04/90		284	28
09/05/90	(23.17)	312	1
09/05/90	(01.32)	313	10
19/05/90		323	4
23/05/90	(in)	327	16
08/06/90		343	

092044

4487

✓

17/8/89	17	61
16/9/89 (in)	78	47
02/11/89	125	78
19/01/90 (BID + other T/S PROBLEMS)	203	19
07/02/90 (needs BID)	222	2
09/02/90	224	5
14/02/90	229	8
22/02/90 (BID + COMPUTER LOCK-UP)	237	41
04/04/90 (both)	278	9
13/04/90	287	2

090045

4488

✓

07/12/89
~~08/15/89~~
 08/09/89
 10/28/89
 11/05/89
 11/08/89 (outside)
 02/15/90
 2/17/90
 2/26/90
 4/5/90
 4/10/90
 5/8/90
 5/11/90
 5/22/90
 6/23/90
 6/29/90

112 21
 +33 7
 40 80
 120 8
 128 3
 131
 99
 230 2
 232 9
 241 38
 274 5
 284 28
 312 3
 315 11
 326 37
 363 1
 364

$$\bar{X} = 22.75$$

$$\sigma = 27.4$$

$$s = 23.8$$

16 Burst clocks
 $\bar{X} = 22.75$ days
 $\sigma = 27.9$

09C046

4490

N

16/10/89

02/11/89

22/11/89

05/12/89

12/12/89 (09:57)

12/12/89 (in) (13:04)

12/12/89 (14:52)

12/12/89 (18:58)

13/12/89 (15:35)

08/01/90 (13:21)

09/01/90 (810 Blow in) (13:55)

09/01/90 (18:10)

12/01/90

31/01/90

13/04/90

05/04/90 (needs 810)

19/04/90

30/04/90 (08:07)

01/05/90 (01:34)

17/05/90

21/05/90

22/06/90 (10:22)

23/06/90 (20:38:22) (10:22)

108

125

145

153

165

165

165

165

166

193

194

194

196

215

277

279

293

304

305

311

326

337

341

17

20

13

7

0

0

0

1

27

1

0

2

19

62

2

14

11

1

6

15

9

4

09C047

4503



05/11/89 (out)	131	20
08/11/89	151	6
04/12/89	157	2
06/12/89	159	31
05/101/90	190	11
17/101/90	201	2
19/101/90 (nails BIO + RESIST PFCB REL)	203	5
24/101/90 (01:26) }?	208	①
25/101/90 (00:21) }	209	4
27/101/90	213	8
06/102/90	221	6
12/102/90 (nails in BIO)	227	36
20/103/90	263	9
29/103/90	272	27
25/104/90	299	

090043

4504

15/7/89	15	10
25/7/89	25	2
27/7/89	27	2
4/8/89	35	9
15/8/89	46	①
16/8/89 } ?	47	15
31/8/89	62	20
20/9/89 (Inside)	82	5
25/9/89	87	45
9/11/89	132	19
25/11/89 (in)	151	13
11/12/89	164	32
12/1/90 (outside)	196	46
27/2/90	242	38
6/4/90	280	59
4/6/90	339	

093049

4507



13/7/89	13	
23/7/89	23	10
15/9/89	77	54
14/11/89	137	60
13/1/90	197	60
20/1/90	204	7
17/3/90	260	56
20/4/90	294	34

093050

4508

✓

18/7/89	18	106
1/11/89 (Inside)	124	64
4/1/90	188	22
26/1/90	210	34
20/4/90	294	

090031

4512



23 110 189

~~23 110 189~~

53 104 190 (m)

15 106 110

105

277

350

172

73

090052

4505

12/03/90
21/05/90

090053

4781

53/03/90 (m)
12/03/90

9

093034

4648

15/11/89

093055

55 - 75	76 - 100	101 - 200
<div> <div> </div> <div> </div> <div> </div> <div> </div> </div>	<div> <div> </div> <div> </div> <div> </div> <div> </div> </div>	<div> <div> </div> <div> </div> <div> </div> </div>
40	21	12
	73	

9387 total maint actions

523 Burst Disks

6% of all failures = BD

~~22% of~~

523 Burst Disks

114 2-6 days apart (aging)

22% of all BD failures
probably caused by failures

090058

9.4

PM SCHEDULES

a. The Program Management Branch (MADF) with assistance from the supporting Engineering and Planning Branch (MA_E) will determine which equipment should be included in the PM Program and performed by Plant Management function. The following criteria will apply to determine whether an item of equipment should or should not be included in the Plant Management function PM Program.

(1) Equipment that would create an unsafe or hazardous environment if failure occurs due to lack of PM will be included.

(2) All peculiar equipment having specific PM requirements delineated by an applicable technical order will be included.

(3) Equipment that is critical to production, and where failure would result in costly downtime, should be included.

(4) Equipment that is subject to breakdown repairs that are expensive compared to PM should be included.

(5) Equipment of small dollar value, where the cost of PM is likely to exceed the cost of replacement upon failure, should be excluded from the program. Some evidence will be maintained by PM Monitor to show that the equipment was considered for inclusion in the program and that a determination was made that no PM was necessary.

(6) PM frequencies will be established so as to space the inspection as far apart as possible to reduce cost, and at the same time, stay within safe limits of time during which defects ordinarily do not develop to the point of needing attention.

b. Operator PM Instructions:

(1) General Operator Maintenance. General instructions regarding lubrication, the state of cleanliness to be maintained, etc., are covered in para 5b of this MAOI, rather than by a separate set of instructions for each item of equipment. Safety precautionary steps must be taken prior to use as specified in the 127 series publication. No daily certification of this performance of the operator maintenance is required.

(2) Specific Operator Maintenance: Operator maintenance instructions of a specific nature will be prepared on AFLC Form 170 and attached to the item of equipment by MADP personnel for ready use by the operator. These instructions should include operator maintenance of a critical nature that, if neglected could result in costly equipment damage or create a condition which is unsafe for shop personnel. The performance of this maintenance must be certified on AFLC Form 355 by the operator. NOTE: The preparation of specific operator instructions on AFLC Form 170 will be unnecessary for many items of equipment.

c. Plant Management PM Instructions:

(1) Plant Management PM Instructions, also on AFLC Form 170, will be prepared by MADP. The frequency code shown on the AFLC Form 170 will be identified to the code contained on the applicable AFLC Form 946. Upon completion, the instructions will be forwarded to the Preventive Maintenance Branch (MADP).

(2) The Program Management Branch (MADF) will use these instructions, along with information from AFLC Form 388, for input of PM actions to the inventory of G0041 system.

(3) AFLC Form 170 instructions will be placed on the equipment by the PM mechanic no later than the next scheduled preventive maintenance.

(4) The PM mechanic will accomplish the PM action and record on the AFLC Form 946. Any deficiencies as to location, tag number, PM instructions, etc., found on the AFLC Forms 170 and 946, and the metal tag will be annotated on the AFLC Form 946. When performing a scheduled PM action, any corrective maintenance (repair) required will be reported to MADSA for a service order.

d. Historical Record:

(1) [REDACTED]

(2) A file of AFLC Forms 388 will be established by MADP for all items of equipment that require PM and will be filed in machine identification number sequence (tag number sequence).

(3) MADP will maintain AFLC Forms 388, Part III, by posting the costs associated with equipment overhaul, breakdown maintenance, and any corrective maintenance of significant dollar value. No PM costs are to be posted on this form.

(4) The purpose of recording historical maintenance costs on individual items of equipment is to provide a sound basis for making decisions on whether to keep or replace an item of equipment when its continued use becomes questionable due to maintenance costs.

(5) The historical record will be pulled from file and attached to the item of equipment when it is turned in.

5. RESPONSIBILITIES AND PROCEDURES:

a. [REDACTED]

(1) Assign a monitor and an alternate to be the central point of contact for distribution and questions pertaining to the Preventive Maintenance Program (G0041).

091001

(2) Monitor both general and specific operator maintenance to assure accomplishment. ~~The shop supervisor will ensure on a daily basis that all operator PM is performed as required on schedule.~~

(3) Provide the necessary coordination with Plant Management, PM Mechanics to ensure that PM actions on equipment can be completed as required.

(4) Ensure each piece of industrial shop equipment is operated by qualified operator.

(5) Review monthly PM inventory listings of equipment in the G0041 system and report to MADF any discrepancies for correction.

(6) Assure AFLC Forms 355 and 170 are attached to each piece of industrial shop equipment determined to require specific operator maintenance daily certification. NOTE: MADF will provide the initial AFLC Form 355, thereafter, it is the owners responsibility to replenish.

(7) Assure that all inoperative equipment is reported to the Trouble Call Desk (MADSA) identified by the five digits of SA-ALC tag. If no tag is attached, identify by noun, stock number, serial number, manufacturer and location.

(8) Assure all proposed changes, relocation, disconnect, etc., on equipment in the PM Program are made in writing to applicable Supporting Engineering/Planning Branch (MA_E).

b. (9) ~~(see change 1)~~

(1) ~~_____~~

~~_____ tag verified prior to the use of the~~

(2) ~~P. _____ operator maintenance and general operator maintenance as specified on AFLC Form 170 attached to the equipment, and _____ on AFLC Form 355. If AFLC Forms 170 and 355 are not attached, then only accomplish the general operator maintenance. General operator maintenance instructions include, but are not limited to, the following:~~

(a) ~~F. _____ adjust lubricators. Lubricate equipment in accordance with recommendations of the equipment manufacturer.~~

(b) ~~_____ reservoirs for _____ and rifting as necessary.~~

(c) ~~CH. _____ and pressure gages to ensure proper lubrication at correct pressures.~~

(d) ~~Add, change, and replace coolants as _____ except when special features, skills or tools are required.~~

(e) ~~Add detergents, skim and clean water tanks.~~

(f) ~~_____ general housekeeping on~~

~~_____ cabinets, clean accumulation of _____ metal chips, etc., from interior of _____~~

(g) Brush away chips, shavings, etc., with a soft brush (air will not be used).

(h) After flushing with coolant, wipe all ways, sides, tables, and open surfaces with a clean cloth assuring all coolant is removed and apply a light coat of oil. In the event there is evidence of rust, heavier weight oil may be required.

(3) Assure hydraulic oil is not allowed to become contaminated. Normal established practices and precautions will be used to prevent foreign matter from entering the hydraulic system. For instance, only lint-free shop rags or paper towels will be used to wipe areas adjacent to the filler tube.

(4) Check level of hydraulic fluid and not allow it to fall below the recommended levels. This will be checked daily with special attention to equipment that requires activation of the hydraulic unit prior to the reading of the hydraulic oil level gage.

(5) Do not leave machine(s) unattended while in operation.

(6) Do not operate equipment if there is any unusual heating, noise, vibration, etc. These deficiencies will be reported to the production supervisor immediately.

(7) Do not lubricate electric motors.

c. Supporting Engineering/Planning Branch (MA_E) will:

(1) Upon receipt of a new item of equipment, initiate and complete Parts I and II of AFLC Form 388, forward with a copy of the vendors service manual(s) and/or Tech Order to MADF for assignment of SA-ALC ID (Tag) number and determination for inclusion in the G0041/PM System. The vendors service manual(s) will be kept in the MAD technical data file for future reference.

(2) Provide MADF the total cost for services (labor and/or materials/parts) to repair and/or maintain IPE. These costs should be provided whenever they are not annotated on a Service Order Form (AFLC Form 600P) or when Service Order Form is not used. Also, provide the equipment's SA-ALC ID (Tag) number to ensure proper posting in its historical record (AFLC Form 388).

(3) Notify MADF in writing of all relocation or removal of equipment identified by tag number, stock number, serial number, and noun. NOTE: On equipment turn in, AFLC Form 388 needs to be attached to the equipment. Notification is required after disconnection and prior to pick up.

d. The Program Management Branch (MADF) will:

091002

21 February 1985

MAOI 66-19

(1) Be responsible for management review, and direction of the updating and file maintenance of the PM scheduling and control portion of the G0041.

(2) Receive all outputs from the G0041 system.

(3) Distribute monthly PM inventory listings and other reports to applicable organizations.

(4) Distribute one copy of the weekly G0041 output products to each performing preventive maintenance function: Valid File Maintenance/Update Listing, Work Schedule, Work Status Report, AFLC Forms 946 and 955. NOTE: Distribution for torque wrenches and lifting devices/aids, see paragraph 7 and 8.

(5) File a copy of the PM work schedule and one copy of each AFLC Forms 946 and 955 in suspense pending completion of the scheduled PM action.

~~(6) Assure, upon receipt of processed AFLC Form 946, that blocks 10, 12, 13, 14, & 15 are properly filled out according to paragraph 11.~~

(7) Assure, upon receipt of AFLC Form 955, that status code is circled to show why PM action has not been completed along with the Julian date and signature and extension of the individual who determined the status. Example: 3 Jan 79 will be 79003. If status has not changed from that previously reported, the AFLC Form 955 need not be completed. NOTE: AFLC Form 955 will not be used to update a PM action.

(8) Transmit completed AFLC Forms 946 and 955 to update the G0041 system.

(9) Remove the duplicate AFLC Forms 946 and 955 from suspense file and destroy.

(10) File the completed AFLC Form 946 until completion of the next cycle.

(11) Review and adjust the PM projection to assure a balanced workload schedule.

(12) Input additions, changes and deletions into the G0041 system by means of AF Form 1530 in addition to remote inputs.

(13) Verify computer outputs of updated transactions for validity and return corrections to Data Automation as required.

(14) Maintain historical record on AFLC Form 388, Part III, provided by applicable support Engineering/Planning Branch on each piece of equipment determined to require periodic PM.

(15) Acquire monthly man-hour and labor costs expenditure (MADP) from cost accounting for man-hour labor rate.

(16) Compute labor and material costs of

equipment repaired from AFLC Form 600P for entry on applicable AFLC Form 388.

(17) Analyze historical records (AFLC Forms 388) on repair cost data to evaluate effectiveness of PM actions being performed and determine the need for a change in frequency or for replacement of equipment.

(18) Upon notification of equipment turn in, PM Monitor will pull historical record (AFLC Form 388) from the central file on equipment to be turned in and attach it to the equipment.

(19) Prepare operator and plant PM instructions.

(20) Estimate labor standards on PM actions in conjunction with PM mechanics, for inclusion in the G0041 system.

(21) Maintain and control assignment of SA-ALC identification (Tag) number (OXXXX) used to identify each individual piece of industrial shop equipment/system. The SA-ALC ID number, noun, Serial Number (S/N) and National Stock Number (NSN) will be stamped on metal tag and permanently attached to the machine accordingly to the following sample:

PROPERTY OF USAF	
SA-ALC ID:	01843
NOUN:	Milling Machine
S/N:	72090
NSN:	3417 00 196 7338

All correspondence including AFLC Forms 388, 600P, etc., concerning an individual piece of industrial production equipment will always reflect the SA-ALC ID (Tag) number. The MADP central record file will be in tag number sequence.

e. Trouble Call Desk (MADSA) will:

(1) Upon receipt of a trouble call on equipment in need of repair from an authorized initiator, prepare AFLC Form 600P in accordance with MADOI 66-1.

f. Applicable performing PM BCC (MADP) will:

Perform, upon receipt of weekly work schedule together with prepunched PM action cards (AFLC Forms 946), PM work and complete AFLC Form 946 as follows:

Enter the date PM action was completed in Block 10. This entry will consist of the last two positions of the year, plus the three position Julian date.

Enter "X" in the update box in Block 15.

Enter PM mechanic's signature and extension in Block 13.

Have the PM mechanic's supervisor "P" stamp in Block 12. NOTE: The "P" stamp will be in addition to the mechanic's signature.

(e) Return completed PM action cards (AFLC Forms 946) to MADF. When PM action cannot be completed by due date, retain AFLC Form 946 and upon receipt of the prepunched AFLC Form 955, circle status code as to reason PM action has not been completed. Enter Julian date, and enter signature and extension of the individual who determined the status and return to MADF. NOTE: AFLC Form 955 will not be used to update a PM action.

(2) Attach AFLC Form 170 (Plant and/or Operator Maintenance Instructions) and AFLC Form 355, on equipment as received from MADF. On equipment that requires specific operator maintenance instructions, AFLC Form 355 must always be used in conjunction with AFLC Form 170.

(3) Permanently attach the identification metal tag (SA-ALC ID Machine Number) to the required equipment. MADF will identify the exact location where the metal tag will be attached to the equipment/system requiring PM.

(4) Upon receipt of AFLC Form 600P, MADP will proceed in accordance with MADOI 66-1.

6. UPDATE G004I RESULTING FROM A MAD PROJECT ON EQUIPMENT:

a. When working a project dealing with new equipment installation, relocation or turn in of equipment, a PM checklist will accompany the Plant Management Work Order, AFLC Form 149. Note: The PM checklist contains all the pertinent information needed to update (add, delete, change) the Preventive Maintenance Program G004I/PM system. The PM checklist will be processed in accordance with MADOI 66-4.

7. PREVENTIVE MAINTENANCE PROCEDURES/RESPONSIBILITIES FOR TORQUE WRENCHES ONLY:

a. Torque Wrench Monitors for owning organization will:

(1) Locate item upon receipt of two prepunched AFLC Forms 946 from MADF for each item due calibration and deliver with the two AFLC Forms 946 to one of the following Tool Crib: Tool Crib #3, Bldg 360, Tool Crib #16, Bldg 375, or the Master Tool Crib, Bldg 312.

(2) Upon presenting the torque wrench and the two AFLC Forms 946 to the nearest Tool Crib, a hand receipt will be issued. This hand receipt will be filed in suspense pending completion of the scheduled PM action.

(3) Present hand receipt to pick up calibrated torque wrench and a completed AFLC Form 946 at a predetermined date.

(4) Remove the previously completed AFLC Form 946 from the file and destroy. Replace it with the new completed AFLC Form 946 until the next cycle.

(5) Upon the receipt from MADF of AFLC Form 955 for a delinquent item, complete as shown in para 5f(1)(e). NOTE: If the status has not changed from that previously reported, the AFLC Form 955 need not be completed.

(6) Notify MADF of changes, deletions, and additions, to update the G004I/PM system via AFLC Form 946 accordingly to Attachment 2.

b. Performing RCC (MADSD) will:

(1) Upon receipt of a torque wrench and two prepunched copies of AFLC Form 946, proceed as follows:

(a) Issue a hand receipt that shows the torque wrench was turned in for calibration.

(b) Fill out both AFLC Forms 946 according to para 5f(1), upon successful calibration of the torque wrench.

(c) Place one of the completed AFLC Forms 946 with the calibrated torque wrench for pick up.

(d) Send the second copy of the completed AFLC Form to MADF for further processing.

(e) Take the torque wrench and the two AFLC Forms 946 to MADPD for repair and calibration if the torque wrench does not check out. MADPD will issue a hand receipt for the item. Then upon completion, MADSD will pick up item and the two completed AFLC Forms 946 and proceed as above in paragraphs (c) and (d).

(f) Upon receiving a torque wrench that requires a tag number, contact MADF (PM Monitor) extension 56747. MADF will assign the tag number (T0000). Write the assigned tag number in Block 2 of the AFLC Form 946 and fill out as required.

c. MADF will:

(1) Send two prepunched AFLC Forms 946 and weekly schedule to the division monitors.

(2) Review for correctness and update via the remote reporting system, upon receipt of completed AFLC Forms 946 and 955. File separately until another PM action negates them.

(3) Send both prepunched AFLC Forms 955 (Equipment Status) to the torque wrench monitor for status on delinquent items. Subsequent weekly AFLC Forms 955 will not be completed if status code has not changed.

(4) Review all changes, additions, and deletions on torque wrenches.

091003

21 February 1985

(5) Establish and maintain a log on "L" numbers assigned to new items.

(6) Establish and maintain a log on tag numbers assigned to new items.

8. PREVENTIVE MAINTENANCE PROCEDURES/ RESPONSIBILITIES FOR LIFTING DEVICES/AIDS:

a. Production Branches (MA_P) will assign a monitor and alternate to be the central point of contact on all lifting devices, aids, and personnel safety items.

b. Owning organization will:

(1) Assure all lifting devices/aids, as defined in MAOI 127-5, and MAOI 127-7, are properly identified to MADPD for proof load testing and inclusion in the G004I system for periodic inspection via AF Form 946.

(2) Notify MADF of changes, deletions and additions of lifting devices/aids to update the G004I system via AF Form 946, according to Attachment 2.

(3) Receive two prepunched AFLC Forms 946 for each item due PM action from MADF. On the AFLC Form 946, Block 3 (Building/Skill) identifies the building where the item is located and the PM action required and Block 7 (RCC) identifies who will perform the PM action or is responsible for getting it accomplished.

(a) Skill Code 6 requires a visual and NDI inspection to be performed by the responsible Product Division.

(b) Skill Code 8 requires a visual inspection, PM maintenance and weight test to be performed by MADPD.

(c) The owning organization (Block 6) on the AFLC Form 946 is responsible for taking the item requiring PM action to the appropriate servicing activity (Product Division or MADPD)

along with the two prepunched AFLC Forms 946.

(d) Upon completion of the PM action, remove the previously completed AFLC Form 946 from the file and destroy. File the new completed AFLC Form 946 until the next cycle.

(e) Upon the receipt of an AFLC Form 955 for a delinquent item, complete as shown in paragraph 5f(1)(e) and return to MADF. NOTE: If the status has not changed from that previously reported, the AFLC Form 955 need not be completed.

(f) Items requiring on-site PM, MADPD1 is the performing RCC.

(g) Fabric constructed slings and personnel restraining devices require inspection by the Textile Laboratory, MAQCA, Bldg 300.

c. The Servicing Activity will:

(1) Perform the PM action upon the receipt of the two AFLC Forms 946 with the item due PM from the owning organization.

(2) Complete the AFLC Form 946 as follows:

(a) MADPD will sign off the AFLC Form 946 returning one card back to the owner to file and sending the other to MADF to update the G004I/PM system.

(b) The servicing activity performing the NDI will "N" stamp the AFLC Forms 946 in Block 12 and write in Block 10 the date completed. The owning organization will sign Block 13, date it in Block 14, and check the update block. The owner will file one of the cards, the other will be returned to MADF to update the G004I/PM system.

d. MADF will

(1) Follow the same procedures as in para 7c.

WOODY R. BAKER, JR., Colonel, USAF
Director of Maintenance

Howard B. Ervin
HOWARD B. ERVIN
Executive Officer
Directorate of Maintenance

2 Atch
1. Instructions for Completing AFLC Form 388
Machine Tool/Equipment Historical Record
2. Instructions for Completing AFLC Form 946
COP/PM Inventory Record

092064

INSTRUCTIONS FOR COMPLETING AFLC FORM 388
(MACHINE TOOL AND EQUIPMENT HISTORICAL RECORD)BLOCKENTRY

Equipment Number

The equipment number will be entered by Program Management Branch (MADF).

PART I

- | | |
|-------|---|
| 1 | Enter manufacturer's equipment number, and if available, the equipment type for more complete identification. |
| 2 | Enter manufacturer's name and code. |
| 3 | Enter manufacturer's model number. |
| 4 | Enter serial number of equipment (as shown on the serial plate). |
| 5 | Enter size/capacity of the equipment. |
| 6 | Enter initial cost or price as listed in the national stock catalog. |
| 7 | Enter month and year purchased. |
| 8 | Enter appropriate classification of national stock number. |
| Blank | Enter Air Force tag number on diamond-shaped tag. |
| Blank | Enter applicable technical order number or appropriate manufacturer's handbook or specification number. |

PART II

Production Section

Enter alpha designation of the appropriate production section or resource control center and facility code.

Bldg Number

Enter the building designation.

Zone Code

Enter the code of the zone in which the equipment is located, if applicable (building grid coordinates).

Column

Enter designation of column nearest the equipment.

Ref to Column

Enter the coordinates or direction and distances of the equipment from the nearest column (such as, NW 20 indicates Northwest 20 feet).

Date Installed

Enter date of installation, when available.

094005

INSTRUCTIONS FOR COMPLETING AFLC FORM 946
(COP/PM INVENTORY RECORD)

1. To update the information in the G004I/PM system, a prepunched or handscribed AFLC Form 946 can be used. All entries will be started in the first portion of the left hand side of each block. Print the name and the telephone extension of the owner in the space above Block 14 on all cards to be processed.

2. Prepunch AFLC Form 946 (Information Typed Across Top of Card).

a. The following entries are required on all prepunched cards submitted for a change or deletion:

- (1) In Block 13, enter signature of initiator and telephone extension.
- (2) In Block 14, enter current date.

b. Changes:

(1) Circle the Block(s) requiring change and print the new entry. Do not complete any block which does not require change.

- (2) In Block 15, enter "X" in the box labeled "Change".
- (3) Complete card(s) as stated in paragraph 2a.

c. Deletes:

- (1) In Block 15, enter "X" in the box labeled "Delete".
- (2) Complete card(s) as stated in paragraph 2a.

3. Handscribe AFLC Form 946 (Blank Card).

a. The following entries are required on all handscribed cards submitted for a change or deletion:

- (1) In Block 1, enter applicable ID ("L") number (LXXXXX).
- (2) In Block 2, enter applicable Tag No. and Nomenclature.
- (3) In Block 13, enter signature of initiator and telephone extension.
- (4) In Block 14, enter current date.

b. Changes:

(1) Circle the block(s) requiring change and print the new entry. Do not complete any block which does not require change.

- (2) In Block 15, enter "X" in the box labeled "Change".
- (3) Complete card(s) as stated in paragraph 3a.

c. Deletes:

- (1) In Block 15, enter "X" in the box labeled "Delete".
- (2) Complete card(s) as stated in paragraph 3a.

4. Additions (New Items Added to the System).

a. New items are added to the system on a handscribed AFLC Form 946.

b. The initiator will provide the following information:

- (1) In Block 2, starting on the seventh position, the name of the item.
- (2) In Block 3, building number.
- (3) In Block 4, owning organization.

094966

10 SAN ANTONIO LOGISTICS CENTER (AFLC)
Directorate of Maintenance
Kelly Air Force Base, TX 78241

Printed
4/1/85

① MADF

MA OPERATING INSTRUCTION 66-19

21 February 1985

Equipment Maintenance

PREVENTIVE MAINTENANCE OF EQUIPMENT

This MAOI establishes responsibilities and procedures for preventive maintenance of Industrial Production Equipment (IPE) and implements AFLCR 66-34, Chapter 3. Contents apply to all organizations within the Directorate of Maintenance (MA).

1. OBJECTIVE: To protect the capability and investment of industrial shop equipment by detecting and correcting minor malfunctions before they become major repair items and disrupt production, or become safety hazards. Preventive Maintenance (PM) is divided into two levels of responsibility, operator and plant management. Input of equipment into the mechanical Periodic Scheduling and Control of Equipment and Personnel System (G0041) will normally be limited to equipment with a cost in excess of \$5,000 or any equipment regardless of cost which is considered critical.

2. TERMS EXPLAINED:

a. Preventive Maintenance (PM): Consists of equipment maintenance actions performed by the operator and/or PM mechanic on a periodic basis.

b. Operator PM: Is performed by the operator on each shift, or each time the equipment is used if not used daily.

c. Plant PM: Preventive Maintenance is performed by Plant Management personnel on a scheduled periodic basis.

d. Industrial Production Equipment (IPE). Machinery, test stands, and related production equipment.

e. PM Action: Is a task contained in the Preventive Maintenance Instructions (AFLC Form 170) detailing the PM to be accomplished along with skill and frequency required. Each PM action is identified by an "L" number (LXXXXX) on the AFLC Form 170 and the G0041/PM System.

f. PM Monitor: The individual(s) in the Program Management Branch (MADF) responsible for management and control of the MA Preventive Maintenance Program.

g. Division PM Monitor: The individual(s) assigned by each of the Product Divisions to serve as the liaison between the PM Monitor and their respective divisions.

h. PM Mechanic: The individual assigned to Preventive Maintenance Branch (MADP) who performs the PM action as required by applicable AFLC Form 170, Preventive Maintenance Instructions.

i. Owning Organization: The Resource Control Center (RCC) having custody of the equipment.

3. FORMS IMPLEMENTED BY THIS MAOI:

a. AFLC Form 355, Operator Maintenance Certification. Will be used to certify performance of operator maintenance of a specific nature.

b. ~~AFLC Form 388, Machine Tool and Equipment Historical Records. Will be initiated by the Engineer/Technician from the applicable Engineering/Planning Branch (MA-EL) for all Industrial Production Equipment or systems with unit cost of \$5,000 or more. Industrial equipment costing less than \$5,000 considered critical and requiring periodic PM. NOTE: An AFLC Form 388 is not required for torque wrenches and lifting aids and devices.~~

c. AFLC Form 946, COP/PM Inventory Record. Prepunched PM action input card to G0041 system.

d. AFLC Form 170, Preventive Maintenance Instructions. A set of instructions placed with the shop equipment which advises the operator and/or PM mechanic of the PM tasks to be performed.

e. AFLC Form 955, Equipment and Personnel Status. Will be used to report status on past due PM action.

f. AF Form 1530, Punch Card Transcript. Used by MADF for submitting additions, changes and deletions into the G0041 system.

g. AFLC Form 600P, Service Order. Used by Trouble Call Desk (MADSA) personnel for equipment repairs.

4. PROGRAM DETERMINATION:

Supersedes MAOI 66-19, 19 September 1983
No of Printed Pages: 9
OPR: MADF (M. Valdez)
Approved by: Col Woody R. Baker, Jr.
Writer-Editor: Irene R. Smith
Distribution: F

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SYSTEM PM LIST

SYSTEM: _____

DATE: _____

SHUT DOWN PROCEDURES: INITIAL OFF

- ☐ Reset Computer
- ☐ Turn off disc Drive, then computer
- ☐ Turn off 480 volts for each T/S on System
- ☐ Turn off 115 volts at wall Panel for each T/S on System
- ☐ Check for no incoming 480 and 115 volts coming in with meter

INITIAL OFF PM AS COMPLETED FOR EACH T/S ON SYSTEM

COMPUTER BAYS

- ☐ Tighten all connections on electrical strips
- ☐ Drive cards: Tighten connection screws (8 ea per card)
- ☐ Check fans for operation: Repair or replace
- ☐ Filters: Clean or replace

MOTOR CONTROL CENTERS

- ☐ Tighten all connections
- ☐ Ballast cabinets: Tighten all connections on electrical strips

T/S PURGE BOXES (TIGHTEN ALL CONNECTIONS ON STRIPS)

- ☐ CRT Purge Box
- ☐ Annunciator Purge Box
- ☐ Stepper Motor Purge Box

T/S: MISCELLANEOUS

- ☐ Check Printer Cover: Repair or Replace
- ☐ Sink Hinges: Tighten as needed
- ☐ Scavenge Pump Strainer: Clean
- ☐ Light Bulbs: Replace inside and out as needed
- ☐ Grease Motors
- ☐ Check Accumulators for 600PS:

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PREVENTIVE MAINTENANCE

PWA50002

When to check	What to check	Item No.	How to check	Cleaning/Maintenance
Monthly	Differential Pressure Valve	765 766(-lonly)	Verify augmentor pump output pressure of 1080±10 psig.	Adjust controller for valves 765 or 766 as required. Adjust needle valves 791 or 792 for smooth operation. Recalibrate transmitter as required.
	Differential Pressure Transmitter	767 768(-lonly)		
Quarterly	Filter	588 590 600	Inspect filter for contamination	Clean filter housing using a suitable solvent. Replace filter element.
Quarterly	Accumulator	702 705	Verify accumulator is charged at 600 psig. Inspect for leaks.	Verify charge on gauge 706 or 776. Charge as required using nitrogen.
Quarterly	Ballast Cabinet	E1138 E1238 E1338	Verify cabinet components are clean and functional. Verify both internal fans are functional. WARNING 480 volts present.	Insure power is "OFF". Repair/replace failed parts, clean cabinet air screens. Replace filters as required.

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PREVENTIVE MAINTENANCE

PWA50002

When to check	What to check	Item No.	How to check	Cleaning/Maintenance
Semi Annual	Temperature Controllers	2,818	Observe operation	Clean as required. Use inhibiso to clean bearings. Do not lubr- icate. Replace controller sub assy as required. Calibrate per Table 8-2.
Semi Annual	Pressure Gauges	800-805 813-815 819,823 825,826 829,830 832,838 644,706 776 782(-lonly)	Verify that gauges read zero with no pressure applied.	Calibrate per Table 8-1. Replace as required.
Semi Annual	Differential Pressure Transducers	E705C-E710C	Verify operation of transducers. Open bleed valves 8,9, 12-15,21-23,28,29. Transducer shall indicate zero.	Calibrate per Table 8-16. Replace as required.
Semi Annual	Pressure Transducers	E711C-E727C	Verify operation of transducers. Verify transducers indicate zero with no pressure applied.	Calibrate per Table 8-16. Replace as required.
Semi Annual	Differential Digigauge	E112C E113C	Verify gauges indic- ate all zeros with bleed valves 16,17, 25,26 open. Adjust zero pot on gauge as required. Close bleed valves.	Calibrate per Table 8-1. Repair/replace as required.
Semi Annual	Digigauges	E109C E110C E111C	Verify gauges indic- ate atmospheric pressure with no pressure applied. Adjust zero pot on gauge as required.	Calibrate per Table 8-1. Replace as required.
emi Annual	Flowmeters	E736C-E742C	Verify flowmeters indicate zero with no flow applied.	Calibrate per Table 8-1. Repair/replace as required.
emi Annual	Thermistors	E728C-E735C	Verify temperature reading on CRT.	Calibrate per Table 8-1. Replace defective thermistors.

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PREVENTIVE MAINTENANCE

PWA50002

When to check	What to check	Item No.	How to check	Cleaning/Maintenance
emi Annual	Temperature Switches	E539-E542 E594	Verify operation.	Calibrate per para. 3-23C. Repair/replace as required.
emi Annual	Flow Switches	E533-E538	Verify operation. Verify switch closes at 50cc per min. flow.	Replace as required.
emi Annual	Pressure Switches	E508, E509 E521-E531 E597, E598 E649(-1only) E659(-1only) E660(-2,-3 only) E593 759 760(-1only)	Verify operation.	Calibrate per para. 3-23A. Repair/replace as required.
emi Annual	Power Supplies	E515-E516 E587-E588	Verify output voltage per Table 9-1.	Adjust output voltage. Replace as required.
emi Annual	D.C. Regulator Assy	E575	Verify output voltage of $3 \pm .015$ vdc.	Adjust output voltage. Replace as required.
emi Annual	Cathode Ray Tube	E61	Verify operation.	Clean, repair/replace as required
emi Annual	Displays	E81-E92	Verify operation.	Clean, repair/replace as required
emi Annual	Annunciator	E802	Observe operation.	Check and repair circuits as required.
emi Annual	Solenoids	E510, E592 E543-E550 E609, E610 E635, E661 E667	Verify functional operation.	Repair/replace as required.
emi Annual	Back Pressure Simulators	541-545 798	Verify B/P Simulator is functional and operating properly.	Repair/replace/calibrate as required. Replace NUPRO filter.
emi Annual	N2 Simulator	684	Inspect general condition for tightness, evidence of binding, alignment and wear. Check operation of stepper motor E756. Check coupling, stop block, stop bar and shaft. Verify N2 Simulator can operate between 43 and 233 psid.	Clean, adjust and align. Repair replace worn parts. Calibrate.

094011

PREVENTIVE MAINTENANCE

PWA50002

When to check	What to check	Item No.	How to check	Cleaning/Maintenance
emi Annual	Gauge Saver	634	Inspect for contamination and function. Set at 160-190 psia.	Clean, adjust. Replace as required.
emi Annual	Hydraulic Orifices	572-575 595,685 735,751 781,785 786,840	Inspect all orifices for contamination and proper size.	Clean orifices using a suitable solvent. Replace worn orifices.
emi Annual	Pneumatic Orifices	514,515 565,676 677,733 679-682 793,841	Inspect all orifices for contamination and proper size.	Clean orifices using a suitable solvent. Replace worn orifices.
emi Annual	Strainers	507,567 586,636 726-731 738	Inspect for contamination.	Clean using a suitable solvent and reassemble.
emi Annual	Reservoir	500	Inspect for contamination.	Remove cover. Clean as required.
emi Annual	Filters	522,533 534,670 722,734	Inspect for contamination.	Clean filter housing using a suitable solvent. Replace filter element.
emi Annual	Air Regulators	546 602 603	Observe operation of regulators and stepper motor E744. Verify G.G. Burner pressure is controlled between 10-580 psia.	Repair/replace regulators and stepper motor as required. Inspect drive shaft for binding and wear. Grease drive shaft per Table 6-2.
emi Annual	Differential Pressure Regulator	568	Observe operation of regulator and stepper motor E753. Verify Fan Exit Temperature Sensor pressure is controlled between 70-191 psid.	Repair/replace regulator and stepper motor as required. Inspect coupling for tightness and drive shaft for binding and wear. Grease drive shaft per Table 6-2.
emi Annual	Air Regulator	559	Observe operation of regulator and stepper motor E745. Verify Pf5a1, Pf5a2 and Pf5a4 are being back pressure properly.	Repair/replace regulator, stepper motor as required. Inspect drive shaft for binding and wear. Grease drive shaft per Table 6-2.

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PREVENTIVE MAINTENANCE

PWA50002

When to check	What to check	Item No.	How to check	Cleaning/Maintenance
Semi Annual	Air Regulator	560	Observe operation of regulator and stepper motor E746. Verify Pf5a3 and Pf5a5 are being back pressured properly.	Repair/replace regulator, stepper motor as required. Inspect drive shaft for binding and wear. Grease per Table 6-2.
Semi Annual	Air Regulator	594	Verify blow gun regulator is set at 20 psig. Read pressure on attached gauge.	Adjust, repair/replace regulator or gauge as required.
Semi Annual	Air Regulator	596	Observe operation of regulator and stepper motor E750. Verify PF1A-PF3A is controlled between 250-350 psid.	Repair/replace regulator, stepper motor as required. Inspect drive shaft for binding and wear. Grease per Table 6-2.
Semi Annual	Air Regulator	597	Observe operation of regulator and stepper motor E749. Verify PF2-PF3 is controlled between 50-7- psid.	Same as above
Semi Annual	Air Regulator	601	Observe operation of regulator and stepper motor E747. Verify Augmentor Burner pressure is controlled between 16-150 psia.	Same as above
Semi Annual	Pressure Regulator	663	Observe operation of regulator and stepper motor E743. Verify Body Pressure is controlled between 35-215 psig.	Repair/replace regulator, stepper motor as required. Inspect coupling for tightness. Inspect drive shaft for binding and wear. Grease per Table 6-2.
Semi Annual	Pressure Regulator	664	Observe operation of regulator and stepper motor E748. Verify Servo Pressure is controlled between 35-550 psig.	Repair/replace regulator, stepper motor as required. Inspect drive shaft for binding and wear. Grease per Table 6-2.

094013

PREVENTIVE MAINTENANCE

PWA50002

When to check	What to check	Item No.	How to check	Cleaning/Maintenance
Semi Annual	Air Regulator	779(-lonly)	Verify proper output pressure to operate Main Relief Valve 780 at cracking pressure of 1125 psig.	Adjust regulator. Repair/replace as required.
Semi Annual	Air Regulator	816	Verify Shop Air regulator is set between 80-90 psig. Read pressure on gauge 825.	Same as above
Semi Annual	Air Regulator	817	Verify Resolver and Ignition Purge regulator is set at 3 psig. Read pressure on gauge 813.	Same as above
Semi Annual	Air Regulator	824	Verify High Pressure Air regulator is set at 700 psig. Read pressure on gauge 823.	Same as above
Semi Annual	Air Regulator	827	Verify High Pressure Air regulator is set at 450 psig. Read pressure on gauge 826.	Same as above
Semi Annual	Air Regulator	828	Verify Vacuum regulator is set between 19-21 inches Hg. Read pressure on gauge 814.	Same as above
Semi Annual	Air Regulator	831	Verify 25# Air regulator is set at 25 psig. Read pressure on gauge 832.	Same as above
Semi Annual	Relief Valve	511	Verify Boost Pump relief valve set pressure is 11 psig (-1 only) 15 psig (-2,-3 only)	Adjust relief valve cracking pressure as required. Repair/replace as required.
Semi Annual	Relief Valve	520	Verify Shop Air relief valve set pressure is 125 psig.	Same as above

094014

PREVENTIVE MAINTENANCE

PWA50002

When to check	What to check	Item No.	How to check	Cleaning/Maintenance
Semi Annual	Relief Valve	524	Verify High Pressure Air Supply relief valve does not relieve under 800 psig.	Adjust relief valve cracking pressure as required. Repair/replace as required.
Semi Annual	Relief Valve	539	Verify High Pressure Air relief valve set pressure is 750 psig.	Same as above
Semi Annual	Relief Valve	558	Verify G.G. Burner Pressure relief valve set pressure is 650 psig.	Same as above
Semi Annual	Relief Valve	658	Verify Augmentor Burner Pressure relief valve set pressure is 160 psig.	Same as above
Semi Annual	Relief Valve	665	Verify Servo Supply relief valve set pressure is 700 psig.	Same as above
Semi Annual	Heat Exchangers	531,576	Observe operation. Verify sufficient cooling of calibration fluid.	Clean or replace as required.
Semi Annual	Chilled Water Valve	635	Observe operation. Verify valve is completely open when test stand is "ON".	Repair/replace as required.
Semi Annual	Chilled Water Valves	783,784 580,581 (-lonly)	Observe operation. Verify operation is controlled by temperature controllers 2,818.	Repair/replace as required. Grease per Table 6-2.
Semi Annual	Sink Exhaust Fan Bldg. 347 only	569	Observe operation. Verify sink fan is "ON" when test stand is "ON".	Clean, repair/replace as required.
Semi Annual	Sink Exhaust Bldg. 348 only	Facility	Observe.	Verify sink is being exhausted.
Semi Annual	Vacuum Pump	604	Inspect condition of pump and motor per para. 6-5.1 and .2 Verify lamp E13 is illuminated when pump is "ON".	Clean, repair/replace as required. Grease per Table 6-2.

094015

PREVENTIVE MAINTENANCE

PWA50002

When to check	What to check	Item No.	How to check	Cleaning/Maintenance
Semi Annual	Pump Module Exhaust Fan Bldg. 347 only	607	Observe operation. Verify exhaust fan is "ON" when a 200hp motor is "ON".	Clean, repair/replace as required. Grease per Table 6-2.
Semi Annual	Pump Module Exhaust Bldg. 348 only	Facility	Observe.	Verify pump module is being exhausted.
Semi Annual	Scavenge Pump	587	Verify operation. Inspect pump and motor per para. 6-7.	Repair/replace as required. Grease per Table 6-2.
Semi Annual	Boost Pump	510 758 (-lonly)	Inspect condition of pump and motor per para. 6-6. Verify lamp E8 is illuminated when pump is "ON".	Repair/replace as required. Grease per Table 6-2.
Semi Annual	Augmentor Pump/Gearbox	759 760 (-lonly)	Inspect condition of pump/gearbox per para. 6-4. Verify oil coolers and pre Lube pump are functional.	Change automatic transmission fluid and filter per para. 6-4.
Semi Annual	Flex Coupling between Pump/Gearbox and motor	759-E625 760-E624 (-lonly)	Inspect.	Grease per Table 6-2.
Semi Annual	Motor	E625 E624 (-lonly)	Inspect condition of motor per para. 6-4.3. Verify lamp E11(-lonly) or E10 is illuminated when motor is "ON".	Grease per Table 6-2. <i>Tighten all connections per Table 6-3</i>
Semi Annual	Differential Pressure Valve	756	Verify PF2-PF3 operates between 50-70 psid. inspect for leaks.	Repair/replace as required.
Semi Annual	Differential Pressure Valve	757	Verify PF1A-PF3A operates between 250-350 psid. Inspect for leaks.	Repair/replace as required.

094016

PREVENTIVE MAINTENANCE

PWA50002

When to check	What to check	Item No.	How to check	Cleaning/Maintenance
Semi Annual	Purge Boxes	E66 E564 E565 E613	Inspect all electrical connections. WARNING 115 volts present.	Insure power is "OFF". Tighten all connections per Table 6-3. Vacuum clean using plastic wand. Replace mufflers and plastic bags.
Semi Annual	Motor Control Center	E501	Inspect all electrical connections and devices. WARNING 480 volts present.	Insure power is "OFF". Tighten all connections per Table 6-3. Vacuum clean using plastic wand. Replace defective devices.
Semi Annual	Ballast Cabinets	E1138 E1238 E1338	Inspect all electrical connections. Verify power supply output voltage 30 ± 2 vdc. WARNING 480 volts present.	Insure power is "OFF". Tighten all connections per Table 6-3. Vacuum clean using plastic wand.
Semi Annual	Power Supplies	E1013 E1014	Verify output voltage of 5 ± 1 vdc.	Adjust output voltage. Replace as required.
Semi Annual	Power Supply	E1015	Verify output voltage of 28 ± 1 vdc.	Adjust output voltage. Replace as required.
Semi Annual	Internal Power Supply	E1001	Verify output voltage of 5 ± 1 vdc.	Adjust output voltage. Replace as required.
Semi Annual	Internal Power Supply	E1004	Verify output voltage of $+15 \pm 1$ vdc and -15 ± 1 vdc.	Adjust output voltage. Replace as required.
Semi Annual	Internal Power Supply	E1009	Verify output voltage of $+15 \pm 1$ vdc, -15 ± 1 vdc and $+5 \pm 1$ vdc.	Adjust output voltage. Replace as required.
Semi Annual	Internal Power Supplies	E1100 E1200 E1300	Verify output voltage of 5 ± 1 vdc.	Adjust output voltage. Replace as required.
Semi Annual	Oscillator	E1016	Verify output frequency of 1000 Hz. at 9 vac.	Adjust output. Replace as required.
Semi Annual	Computer Cabinet Ventilation Fans	E1000	Verify operation of four fans located in base of cabinet.	Replace as required. Clean filter elements.
Semi Annual	Muffin Fans	E1055 E1056	Verify operation of six muffin fans located in cabinet "D".	Replace as required.

094017

MAINTENANCE CALLS OVER 180 DAY CALENDAR CYCLE TEST STANDS (50002/4/5)

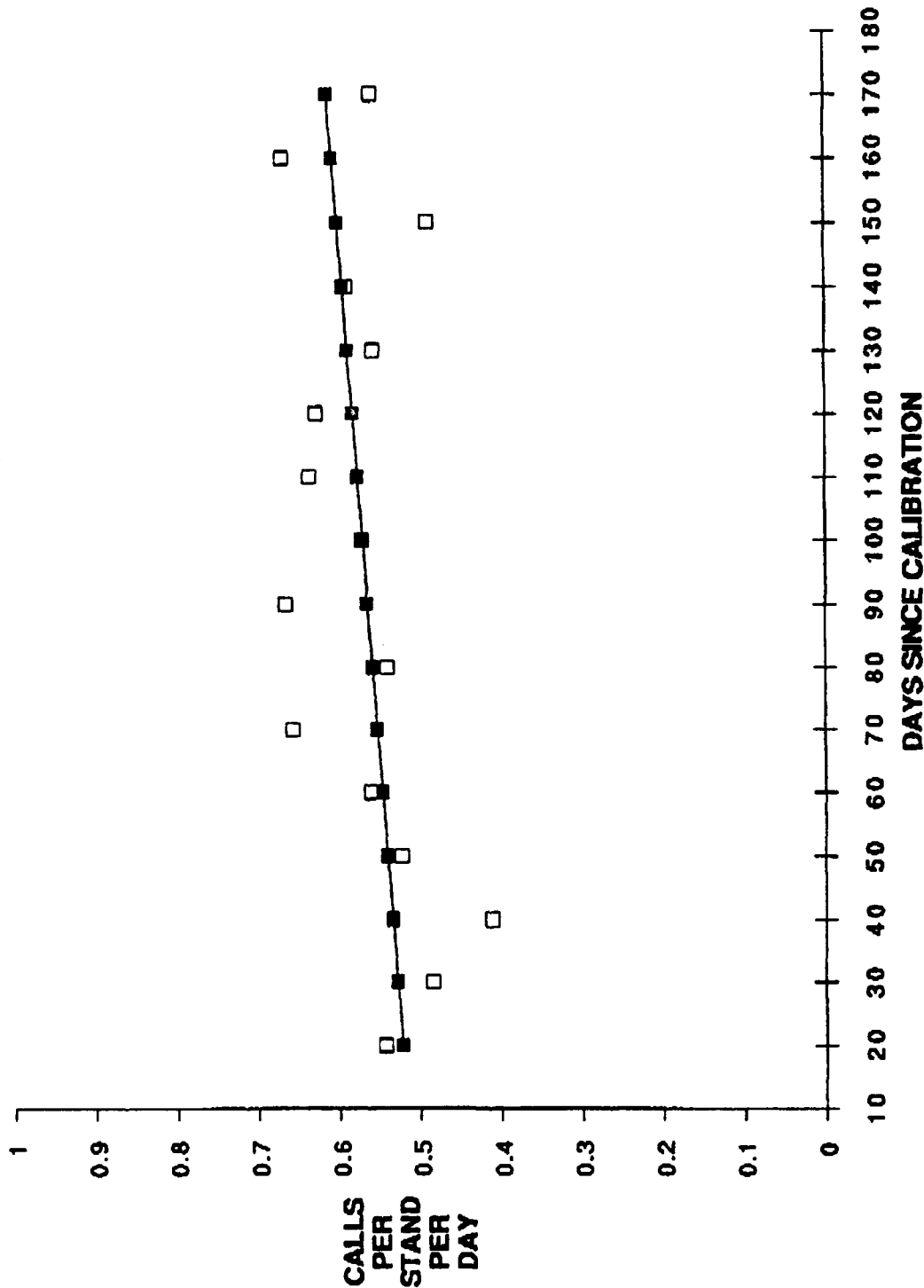


Figure 6.2.1.1.4-1

	Days	Calls/dy	c-fit	c-fit w/o end pts.
I	- 10	0.429	0.520	0.517
II	- 20	0.544	0.523	0.523
21	- 30	0.484	0.527	0.528
	40	0.411	0.530	0.534
etc	50	0.522	0.534	0.540
	60	0.560	0.537	0.546
	70	0.656	0.541	0.552
	80	0.540	0.544	0.558
	90	0.664	0.548	0.564
	100	0.571	0.552	0.570
	110	0.636	0.555	0.576
	120	0.627	0.559	0.582
	130	0.556	0.562	0.588
	140	0.589	0.566	0.594
	150	0.489	0.569	0.600
	160	0.667	0.573	0.606
	170	0.558	0.576	0.612
	180	0.393	0.580	0.618

Regression Output:

Constant	0.510611	
Std Err of Y Est	0.068001	
R Squared	0.156533	<u>0.395643</u>
No. of Observations	16	
Degrees of Freedom	14	
X Coefficient(s)	0.000594	
Std Err of Coef.	0.000368	

without end points

Regression Output:

Constant	0.516049	
Std Err of Y Est	0.084607	
R Squared	0.050551	0.224836
No. of Observations	18	
Degrees of Freedom	16	
X Coefficient(s)	0.000354	
Std Err of Coef.	0.000384	

with end points

note: this is average data for 45 test stands and is derived from GO-11 data. Type 500002/4/5 test stands are included. Stand #'s 4458, 4484, 4485, and 4486 are not included due to bad data.

9.5

OVERHAUL/BENDIX

ENGINEERING NOTES

EMPLOYEE GARDNERDATE 30 July 90PAGE NO. 1RCC MAITPFASUBJECT UFC FLOWTIMES

Standard flowtimes for UFCs are: 57 days for F-15 and 59 days for F-16. Current average historical flowtimes are 116 days for F-16 + 109 days for F-15. The single greatest contributor to long flow times appears to be time spent Awaiting Parts (AWP). These figures are heavily skewed by a small number of UFCs with flowtimes of 1-2 years. ~~The~~ A primary cause for these extreme flowtimes appears to be supply difficulties. A general difficulty in obtaining various piece parts causes a high rate of AWPed UFCs. In an attempt to keep production rates up, the shop uses "Legal Kolo-Backs" ~~to~~ to repair some UFCs using parts from others (which are themselves incomplete). This practice has the effect of maximizing the use of available spares resources and minimizing the impact of supply difficulties on Field readiness rates. It is common throughout military & civilian fleet maintenance situations.

This practice does have a drawback in the MAITPFA agency however. It causes average flowtime figures to become increasingly skewed and presents a very negative picture of the MAITPFA production process, ~~even~~ when actually the process is functioning quite efficiently. If this procedure were discontinued the "numbers" would look better (average flowtime would drop) but fewer fighter aircraft would fly. This is an excellent example of the effects of serious AFMC-wide problem: The use of misleading "average" figures to manage highly variable processes.

The UFC OCM process is characterized by extreme variability. This is the nature of the beast. To understand the UFC process requires all levels of AFMC management to study multiple sets of statistics (including those generated by

DDB SECTION CODE 9.0

DDB PAGE NO. _____

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ENGINEERING NOTES

EMPLOYEE GARDNERDATE 30 July 90PAGE NO. 2RCC MATPFASUBJECT UFC FLOWTIMES

their customeress) - Not one "average" figure. High variability processes are harder to manage than low.

- A good example of this is: How much does a UFC repair cost?

MM "pays" MATPFA about \$20,000 to repair a UFC. This is supposed to be an average cost which gives a true picture of the cost of repairing many UFCs over time. It is apparently based on a DPSTH (another average) of 367 labor hours x \$43.09/hour (average MATPFA labor rate) plus some other burden costs. No UFC ever really costs \$20K to fix! Some cost as little as \$1000 - \$2000 while others probably cost ~~over~~ over \$100,000. The use of an average (probably a pretty good one) makes accounting very easy for MM, MA, or the rest of the Air Force, but makes life very difficult for production (the heart of the AFCC mission). Using an ^{only} average to describe a variable process can cause very uneconomical decisions. If you only know what everything costs (an average), you never know what anything costs.

How much can a repair cost? If the UFC has been AWP for 2 years and the victim of multiple rob backs:
Holding cost:

According to MM, a UFC costs \$160K.

At 7% ~~cost~~ (T bill rate) x \$160K x 2 years = \$22400

PARTS:

Parts for a UFC are very expensive. Assuming that most of the usable high-demand parts have been removed (in 2 years) replacement parts could easily cost \$25K. (A DB alone is over \$10K and is a critical high-demand item).

ENGINEERING NOTES

EMPLOYEE GARDNERDATE 30 July 90PAGE NO. 3RCC MATPFASUBJECT UFC FLOWTIMESLABOR:

given 2 years of red-backs & multiple "false starts" where the UFC is restarted in production only to go Awol again, the real labor cost could easily be 3 to 4 times higher than the average (which includes ~~the~~ UFCs that go through in 3 days).

$$4 \times 367 \text{ hours} \times \$43/\text{hour} = \$63,124$$

$$\boxed{\$22,400 + \$25,000 + \$63,124 = \$110,524}$$

The actual cost of repairing this UFC is already over \$110K, & does not even include the costs of extra scheduling / planning / storage / handling / management required to keep an item around under these conditions. Given the AFLL policy of replacing parts when their repair cost reaches 75% of replacement (\$120K for \$160K UFC), some UFCs are probably not even worth repairing. ~~Even~~ the increased reliability & reduced depot workload that would result from a new procurement could easily offset the "savings" a repair appears to offer.

This is a case where using an average cost produces an inappropriate decision. This situation is common throughout AFLL (well-documented in paragraph 3.0 of the TOEI (SR)). It is especially critical in areas, such as MATPFA, where the process is unusually variable.

A possible solution

~~The solution~~ to this problem is two-fold:

- First, the development of a "menu" pricing / scheduling / and planning system will drive management away from the use of misleading averages. It will also serve to assign production credit for the work performed and maintain a better system to track and manage costs.

ENGINEERING NOTES

EMPLOYEE GARDNERDATE 30 July 90PAGE NO. 4RCC MATPFASUBJECT UFC FLOWTIMES

- Second, Restructure the current repair contract with Bendix to call for overhaul, rather than OCM. This will allow ~~the~~ MATPFA to concentrate on what it is designed to do - OCM & send those UFCs that require extensive work to Bendix for overhaul. This will result in less variability for both MATPFA & Bendix and increased availability of UFCs in the field.

While the unit repair cost for a Bendix repair will increase, the total number ~~of~~ repaired there can be reduced and the volume of WIF maintained at Bendix (3 times higher proportionately) than that at MATPFA can be reduced. Bendix & USAF can easily negotiate fixed overhaul rates & fixed ~~to~~ flow times. This will also provide an avenue for overhauling those UFCs that reach the end of their operating life (3500 hours I think). Currently, neither Bendix nor MATPFA is ready to deal with these.

As the demand for UFCs decreases (as the new models go into service), the number sent to Bendix (the most expensive work) can be reduced. This will keep demand in MATPFA steady & minimize impact to personnel & management of fluctuating field demand.

For every day that is sent to Bendix (3-4 times ave labor rate) 3-12 UFCs can be repaired in MATPFA. The end result will be increased productivity from MATPFA & reduced costs from Bendix. This whole operation should be under the direction of a Mat'l Review Board (MRB) which includes a representative from production & Engineering.

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DDB PAGE NO. _____

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EMPLOYEE GARDNER

DATE _____

PAGE NO. 1RCC MATPFASUBJECT Tech Orders

The Tech orders (TOs) used in the UFC repair process are designed to support overhaul, not OCM. Given the cumbersome & expensive nature of TO updates and the basic formatting problems with the current TOs, I don't think they should be used as the guidance document for craftsmen working OCM. They will never be any good no matter how often they are updated. They are not designed to support the OCM process.

I propose the Air Force develop a "process spec" which ~~is~~ extracts basic specifications from the TO and combines them with the current "in-use" process (stored largely in the brains of craftsmen and supervisors). This process data should be presented in a user-friendly "checklist" format that presents the craftsman with the info needed to make OCM decisions and perform OCM tasks. Dr Majoros (Human Factors) and his team will select one or two steps in the OCM process and produce a sample document. If the results are successful and can be used by production, we will recommend a focus study effort to produce a spec for the entire process. This effort will be coordinated w/mm as well as MATPFA.

Some advantages would be:

- 1) better support for the OCM process
- 2) local (vs AFLL/USAF) management of updates/changes
- 3) accelerated training time for ^{new} OCM craftsmen.

DDB SECTION CODE 9.0

DDB PAGE NO. _____

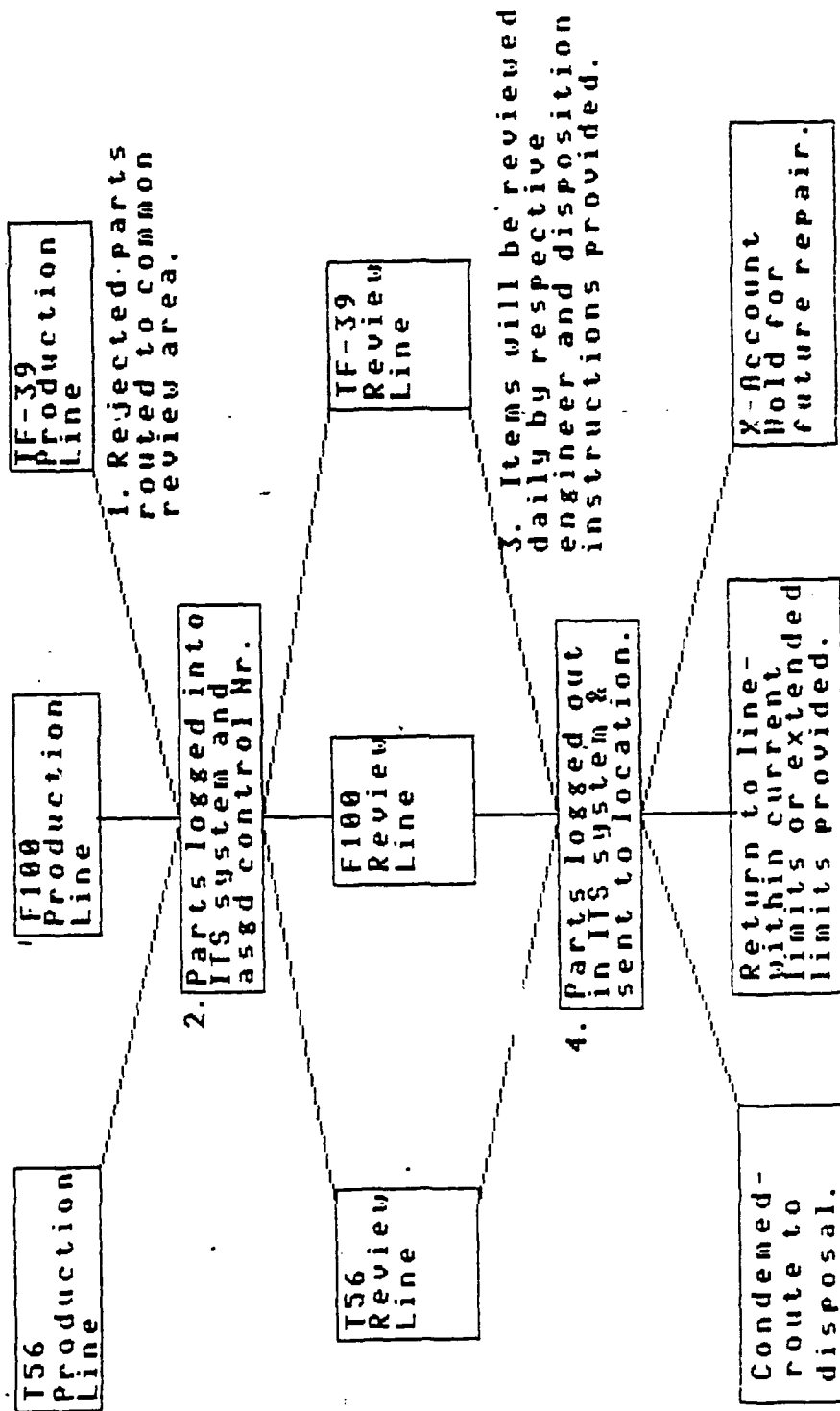
095065

9.6

MRB/HIRE MECHANICAL ENGINEER

PROPOSAL FOR CONSOLIDATED
MATERIAL REVIEW AREA
AT SA-ALC
5/16/90

090001



MATERIAL (RECOVERABLE OR E.O.Q.) REJECTED BY THE PRODUCTION LINE FOR THE FOLLOWING REASONS. WILL BE ROUTED TO THE REVIEW AREA.

1. DISTRESS MODE IS NOT SPECIFICALLY ADDRESSED IN RESPECTIVE TECHNICAL ORDER.
2. DISTRESS MODE HAS A REPAIR IN THE TECHNICAL ORDER, BUT REPAIR HAS NOT BEEN PROTOTYPED.
3. PART HAS INSUFFICIENT CYCLES OR HOURS TO MAKE THE NEXT SCHEDULED DEPOT VISIT. (THIS DOES NOT EXCLUDE USING THE PART ON A MINOR REPAIR.)
4. PART EXCEEDS CURRENT REPAIR LIMITS AND RESPECTIVE TECHNICAL ORDER DOES NOT SPECIFICALLY STATE PART SHOULD BE CONDEMNED.

MATERIAL (RECOVERABLE AND E.O.Q.) REJECTED BY THE PRODUCTION LINE FOR THE FOLLOWING REASONS. DOES NOT REQUIRE REVIEW.

1. 100 PERCENT REPLACEMENT ITEMS OR EXPENDABLE ITEMS.
2. RESPECTIVE TECHNICAL ORDER SPECIFICALLY STATES ITEM WILL BE CONDEMNED.
3. RESPECTIVE TIME COMPLIANCE TECHNICAL ORDER (TCO) STATES ITEM WILL BE CONDEMNED OR OTHER DISPOSITION ACTION IS PROVIDED.
4. ITEMS WHICH ARE SUBJECT TO WRITTEN DISPOSAL INSTRUCTIONS, AS PROVIDED BY THE DIRECTORATE OF MATERIAL MANAGEMENT.
5. ITEMS SUBJECT TO CONTRACTOR REPAIR. THESE ITEMS MUST EXCEED THE CURRENT REPAIR CAPABILITY OF THE DIRECTORATE OF MAINTENANCE, BUT BE WITHIN THE MAXIMUM REPAIRABLE LIMITS OF THE RESPECTIVE TECHNICAL ORDER.

FLOW OF MATERIAL:

1. F-100, T-56, AND TF-39 PARTS SUBJECT TO REVIEW (AS DEFINED ABOVE), WILL HAVE AN SA-HLC FORM H-240 (ATTACH #1) ATTACHED TO THE PART AND BE ROUTED TO THE REVIEW AREA-- THE INITIATOR OF THE SA-HLC FORM H-240 WILL ENSURE THAT BLOCKS 1 THROUGH 10 ARE ACCURATE AND COMPLETE.

NOTE: LARGE ITEMS WILL BE REVIEWED ON LOCATION. IT WILL BE THE RESPONSIBILITY OF THE PRODUCTION LINE TO NOTIFY THE REVIEW AREA WHEN ON LOCATION REVIEW IS REQUIRED.

2. UPON RECEIPT IN THE REVIEW AREA, THE PARTS WILL BE LOGGED INTO THE INVENTORY TRACKING SYSTEM (ITS) AND ASSIGNED A NONCONFORMING MATERIAL REVIEW CONTROL NUMBER (NCMR). THOSE ITEMS WITH A KNOWN DISPOSITION (I.E.: X ACCT., CONDEMNED, OR WITHIN CURRENT REPAIR CAPABILITY) WILL HAVE THE SA-HLC FORM H-240 SIGNED OFF BY THE M.A. REPRESENTATIVE AND THE PART WILL BE PROCESSED BY THE M.A. REPRESENTATIVE.
3. THOSE PARTS REQUIRING REVIEW BY THE RESPECTIVE ENGINEER WILL BE HELD ON SEPARATE ENGINE LINES (WITHIN THE REVIEW AREA) AND MATERIAL WILL

WILL BE REVIEWED BY THE ENGINEER DAILY. UPON COMPLETION OF ENGINEERING REVIEW, PART WILL BE PROCESSED BY THE M.A. REPRESENTATIVE.

UPON COMPLETION OF BLOCKS 11 THROUGH 18 BY THE M.M. REPRESENTATIVE OR ENGINEER, 1 COPY WILL REMAIN WITH THE PART AND 1 COPY WILL BE RETAINED IN THE REVIEW AREA.

INFORMATION FROM THE SA-ALC H-240 WILL BE INPUT DAILY, BY THE DATA COLLECTION SPECIALIST. QUARTERLY REPORTS BY ENGINE WILL BE PROVIDED TO THE RESPECTIVE E.S., FOR DO 41 ACTION (ATTACH. #2). THE E.S. WILL BE REQUIRED TO MANUALLY PLUG IN ONE TIME USE AND X CONDITION ITEMS, AS CONDEMNATIONS.

(SA-ALC SHOULD ATTEMPT TO MAKE THIS AN AUTOMATED PROCESS)

4. UPON COMPLETION OF REVIEW ACTION, PART WILL BE LOGGED OUT OF THE REVIEW AREA USING THE INVENTORY TRACKING SYSTEM. ITEMS PROCESSED OUT OF THE REVIEW AREA WILL BE IN ONE OF THE FOLLOWING CATEGORIES:

- A: REPAIR IS IN TECHNICAL ORDER AND REPAIR PROTOTYPED OR PART IS RETURNED TO SERVICE THROUGH EXTENDED LIMITS-RETURN TO PRODUCTION LINE.
- B: CONDEMNED-PROCESS TO DISPOSAL (DO NOT SEND SA-ALC H-240 WITH PART. ANNOTATE NCMR CONTROL NUMBER IN REMARKS COLUMN.)
- C: HOLD FOR FUTURE REPAIR-ROUTE TO X ACCOUNT.

M. PERSONNEL REQUIREMENTS:

- A. EQUIPMENT SPECIALIST (1 EA.-FULLTIME FOR MAE/1 EA. AS NEEDED FOR MAT) RESPONSIBILITIES INCLUDE:
 - 1. SIGN OFF ON SA-ALC FORM H-240, WHEN PART IS BEING CONDEMNED, ROUTED TO X ACCOUNT, OR CLARIFYING EXISTING TECHNICAL ORDER CRITERIA.
 - 2. GENERATE MONTHLY PARTS HANDLING REPORT. (ATTACH. #3)
 - 3. COORDINATE REVIEWS FOR X AND R ACCOUNT MATERIAL, AS NEEDED.
 - 4. PROVIDE ASSISTANCE FOR AFLO 252, FOR PROBLEMS ENCOUNTERED DURING REVIEWS.
 - 5. MAINTAIN LOG FOR ASSIGNING NCMR CONTROL NUMBERS.
 - 6. NOTIFY RESPECTIVE E.S. WHEN AN AFLO 206 IS REQUIRED FOR PROTOTYPING OF REPAIRS AND PROVIDE ASSISTANCE AS NEEDED.
- B. DATA COLLECTION SPECIALIST (1EA.-FULLTIME FOR MAE/1EA. AS NEEDED) RESPONSIBILITIES INCLUDE: (FOR MAT)
 - 1. INPUT OF ALL INFORMATION FROM SA-ALC FORM H-240.
 - 2. REQUEST AND DISTRIBUTE QUARTERLY REPORTS TO RESPECTIVE OFFICES.

M. A. PERSONNEL REQUIREMENTS:

A. PLANNER (1 EA. -FULLTIME FOR MAE/1 EA. -AS NEEDED FOR MAT) RESPONSIBILITIES INCLUDE:

1. GENERATE SUPPLEMENTAL W.C.D.'s AS REQUIRED FOR REPAIR.
(IT IS UP TO THE DISCRETION OF THE PLANNER WHETHER THE INSTRUCTION BLOCK ON THE SA-ALC FORM H-240 OR SUPPLEMENTAL WORK CONTROL DOCUMENT (W.C.D.) IS REQUIRED.)
2. PROVIDE ASSISTANCE IN CORRECTING EXISTING W.C.D. PROBLEMS AND PROCESSING OF MATERIAL THROUGH MAINTENANCE.
RECOMMENDATION: ALLOW THE PLANNER ASSIGNED TO THE REVIEW AREA TO ASSIGN ALL AFLO 103 CONTROL NUMBERS. PRIOR TO PROCESSING THE FORM TO M.M.L. THIS WILL PROVIDE A COMMON FOCAL POINT FOR THE CONTROL OF AFLO 103's. UPON RECEIPT OF A COMPLETED AFLO 103, THE INFORMATION CAN BE ENTERED INTO THE SAME DATABASE USED TO COLLECT THE NCMR ACTION. THIS WILL PROVIDE ONE COMMON SYSTEM FOR ALL NONCONFORMING MATERIAL REVIEW ACTION. IDEALLY THE AFLO 103 WILL ONLY BE USED FOR WORK STOPPAGE SITUATIONS OR PARTS SUBSTITUTION.
3. MAINTAIN LOG FOR ASSIGNING AFLO 103 CONTROL NUMBERS.
4. PROVIDE ASSISTANCE FOR PROTOTYPING OF REPAIRS.

B. PRODUCTION INSPECTOR (2EA. -FULLTIME FOR MAE/2EA. -AS NEEDED FOR MAT)

RESPONSIBILITIES INCLUDE:

1. INSPECTION OF MATERIAL
2. PROCESSING OF MATERIAL, INCLUDES PACKAGING AND LABELING OF MATERIAL.

BENEFITS OF SYSTEM:

1. STANDARDIZED SYSTEM FOR PARTS TRACKING AND DISPOSITION.
2. IDENTIFY TECHNICAL ORDER CHANGE REQUIREMENTS.
3. IDENTIFY NEW FAILURE TRENDS AND INITIATE REPAIRS IN A TIMELY MANNER.
4. IDENTIFY ORGANCIALLY CAUSED PARTS DAMAGE AND INITIATE CORRECTIVE ACTIONS AS REQUIRED.
5. ASSIST IN ESTABLISHING PROJECTED PARTS REQUIREMENTS.
6. IDENTIFY COST SAVINGS ASSOCIATED WITH NEW REPAIRS.

CHANGES REQUIRED TO IMPLEMENT SYSTEM:

1. GAIN ACCESS TO OC-ALC DATABASE AND INTERFACE WITH E-1434.

09C065

(STORES ALL NCMR ACTION AND LINKS NATIONAL STOCK NUMBER
TO RESPECTIVE E.S. AND I.M.)

- 2. REVISE EXISTING REGULATIONS.
- 3. CONSOLIDATE, RELOCATE, AND EXPAND EXISTING REVIEW AREA.
(BY LOCATING REVIEW AREA ADJACENT TO EXISTING TURN-IN
AREA, MATERIAL WILL BE PROCESSED FASTER, WITH LESS CHANCE
OF MATERIAL BEING MISROUTED.)

090046

Attach #1

NONCONFORMING MATERIAL REVIEW REQUEST AND REPLY

A 1. TO (Name / Routing Symbol / Phone)		MAINTENANCE		NCMR CONTROL NUMBER	
2. FROM (Name / Routing Symbol / Phone)		3. DATE			
4. ENGINE TYPE		5. NOUN		6. TECHNICAL ORDER	
7. PART NUMBER		8. SERIAL NUMBER		9. NATIONAL STOCK NUMBER	
DEFICIENCY AND RECOMMENDATIONS (include tolerance and actual dimensions)					

10. TO (Work Station)		MATERIEL MANAGEMENT		M		P		Q	
11. POSITION		12. DATE							
<input type="checkbox"/> A. USE AS IS <input type="checkbox"/> B. ONE TIME USE - COUNT AS CONDEMNED <input type="checkbox"/> C. SELECT FIT <input type="checkbox"/> D. TURN-IN REPARABLE <input type="checkbox"/> E. H. CONDEMN <input type="checkbox"/> F. M. REPAIR <input type="checkbox"/> G. N. NOT NCMR <input type="checkbox"/> H. R. RETURN TO NCMR <input type="checkbox"/> I. X. X-CONDITION CODE									
INSTRUCTIONS									

09C007

13. REQUIREMENTS			
<input type="checkbox"/> AF FORM 252	<input type="checkbox"/> AF FORM 2600	<input type="checkbox"/> SAFETY	<input type="checkbox"/> NUCLEAR HARDNESS
<input type="checkbox"/> AF FORM 95 / DD FORM 1554	<input type="checkbox"/> AFFECTED END ITEM PERFORMANCE STATEMENT	<input type="checkbox"/> SHOP DAMAGED	
14. APPROVAL		COORDINATION APPROVAL	
15. MMPPR / AEROSPACE ENGINEER		16. DATE	
17. MMPPR / NCMR		18. MAEN OR MATE	
19. ATTCH			

F-100
PARTS HANDLING REPORT
FEBRUARY 1990

SECTION: MAEPH

ITEM	P/N	DISTRESS	COST	CONDEMNED/USE WITH 103/X ACCT
COMP. DISK	4030605	BENT RIM LUG (2 EA.)	\$12,000.00	X
COMP. DISK	4041337	BENT RIM LUG	\$10,500.00	X
COMP. DISK	4022609	BENT RIM LUG	\$17,000.00	X
2 COMP. DISK	4022612	BENT RIM LUG	\$8,000.00	X
3 COMP. DISK	4041013	BENT RIM LUG (2 EA.)	\$27,500.00	X
LEVEL GEAR	4001867	TOOLING DAMAGE TO I.D. (5 EA.)	\$7,000.00	X

TOTAL COST

\$82,100.00

COST FOR MAEPH: \$82,100.00

DIFFERENCE FROM PREVIOUS MONTH: +\$12,100.00

SECTION: MAEPF

ITEM	P/N	DISTRESS	COST	CONDEMNED/USE WITH 103/X ACCT
ST FAN CASE	4064671	WARPED DUE TO GRINDING	\$50,000.00	X
FAN DISK	4059002	NICKED BLADE SLOT	\$9,700.00	X
FAN DISK	4059171	NICKED BLADE SLOT (2 EA.)	\$25,000.00	X

TOTAL COST

\$84,700.00

\$50,000.00

TOTAL COST FOR MAEPF: \$84,700.00

DIFFERENCE FROM PREVIOUS MONTH: +\$15,620.00

TOTAL COST FOR MAEPH AND MAEPF: \$166,800.00

DIFFERENCE FROM PREVIOUS MONTH: +\$28,720.00

T. NEDEL/MMP/CAB/56577

090069

Attach #4.

TYPICAL SAVINGS ASSOCIATED WITH REVIEW AREAS

ITEM	PN.	N/S/N	QTY.	TOTAL VALUE
INLET CASE	4001737	2840002803961PT	88	\$2,112,000.00
FAN DUCT	4046405	2840010135155PT	26	\$1,014,000.00
SUPPORT	4055012	2840010806549PT	70	\$337,680.00
RING HOLDER	4023735	2840003315525PT	276	\$181,608.00
SUPPORT	4042645	2840003957119PT	31	\$106,051.00
INLET CONE	4022280	2840003214566PT	137	\$237,969.00

				\$3,989,308.00

THERE WAS AN ADDITIONAL SAVINGS OF \$5,012,912.00 DURING THE TIME PERIOD FROM 9-25-85 TO 8-18-88. THIS SAVINGS WAS INCURRED THROUGH THE USE OF AFLC FORM 103 (NONCONFORMING TECHNICAL ASSISTANCE).

FOR ADDITIONAL INFORMATION, PLEASE CONTACT: T. MEDEL III
MMFRT/57021

0909.0

9.7

PROCESS SPECIFICATION DATA

ADDITIONAL NOTES REGARDING HUMAN FACTORS EVALUATION
OF SAN ANTONIO UFC TEST AND REPAIR FACILITY, KELLY AFB

A. Majors, S. Heinze, P. Neander, Douglas Aircraft Co.
September 18, 1990

Observations

Physical condition

Test Stand Operation. Accessibility of tools is good since operators have tool boxes close at hand. Some tool boxes were observed containing tool pockets cut into foam to insure that tools could be quickly accessed and not lost. Attachment of lines to plumbing hook-up points is time-consuming due to the nature of fuel controls (attachment can take up to three hours); this operation could be assigned to a lower skill trainee to better use skilled operators' time. Improved labeling of test stand hook-up lines may also help to reduce the time for this task. Test stands appear well designed, although frequent checking of computer screen (on the larger stands) while making adjustments on controls may be fatiguing.

Space between stands, cushioned mats on floor, and bench-top space appear adequate. Shop is clean and not unusually noisy.

Operators' aprons and goggles are adequate, and do not appear to inhibit movement. Sliding spray screens near controls can be positioned to protect operators from high-pressure spray. Emergency stop switches are well placed and labeled. In general, responsible safety concerns are evident.

Regarding lighting, work on controls seems to require higher levels, but the screens on test stands seem to require lower levels. No measurements were taken, but we recommend them. If lighting in the shop is increased, add shrouds over the computer screens.

Fuel Control Repair. Tools are readily accessible since tool boxes are located next to work benches.

The repair area is spacious, although an observer might have the impression that individual craftsmen do not have adequate benchtop

097001

space for their tasks. There was no close observation regarding this need. Repair people have mats on which to stand, stools for sitting, bench-top surfaces, parts trays, and a clean and orderly work environment. We did not study these features closely; craftsmen may have a number of "likes" and "dislikes" about these items and production may or may not be affected by them.

Area lighting seems to be adequate, but task lighting does not (again though, no measurement).

Test Stand Repair (On-Site Maintenance). Personnel come into the test and repair facility to maintain test stands. The larger stands are well designed for repair and maintenance access, although particular problems may be present of which we are unaware. We did not observe access provisions on small stands.

Work inside stands may be difficult and uncomfortable, especially for tall persons. The floor surface is steel grate, task lighting must be brought in, and pumps (for those times when pumps must be running while on-site maintenance is inside the stand) probably create high noise levels.

Access around and between stands is cramped and it seems that moving tools, components and support items (lights, hoists, etc.) would be difficult. Long repair times on test stands creates a snowballing problem: controls might be moved to another test stand, long "negotiations" regarding test stand versus control diagnosis may occur, and predictability of production is reduced.

The layout of stands is understandably oriented to use of the stands rather than repair of the stands, but because test stands require considerable scheduled and unscheduled maintenance, efforts to reduce the frequency of test stand repair should be aggressively investigated.

Morale, Supervision, and Management

We made no formal study of these factors, but discussion with several facility personnel and with MDC on-site personnel gave us some impressions. Test and repair facility personnel enjoy good morale. No suggestion of apathy was encountered. There is a shared perception that the work of the facility requires extensive training,

097002

skill, perseverance, and intelligence. Personnel are aware of the importance of their production to Air force readiness and have been recognized with several awards. The facility is the subject of attention and personnel generally believe their problems can be solved.

Some personnel at various ranks and levels may have come to believe that all aspects of test and repair require high skill levels and that their field (i.e., unified fuel controls) is so complex that standardized procedures are not useful. We believe that supervisors and managers should be aware of this thinking and try to modify it throughout the facility to this end: not all aspects of test and repair require high skill levels (so it is good to allocate skill where it does the most good for production) and standardization is especially useful with complex equipment.

Supervision has a challenging, dual task: (1) encouraging independent thinking among test and repair personnel and, at the same time, (2) teaching their people to seek expert help and accept management goals for the facility. Our impression is that the supervisors in the facility are required to devote too much attention to threading through these matters and do not have enough time and attention for increasing and improving the quality of technical information available to operators and craftsmen.

Management has helped to raise morale even while keeping up a steady pressure for increased production. However, misperceptions about levels of production and quality circulate through the facility, suggesting that management could gain more cohesiveness and cooperation in the shop and could represent itself more accurately to base (executive level) management if they published data with consistent, commonly understood meanings.

Training

We were not able to study training curricula, methods, or material. Research from other fields of maintenance indicates that training can have a significant impact on production and quality.

Shifts. Breaks. Work Schedules

SURGE

Mr. Hunter was

Busy

097003

These factors were not studied. However, it appears to us that changes to improve efficiency and throughput would be easier to accomplish in areas other than shifts, breaks, and work schedules.

Processes

Many observations about processes with the UPC facility are contained in our Engineering Notes of July 20 and August 15, 1990. We believe that processes offer a great potential for improvement especially if these are in association with personnel (e.g., training, allocation of skills) and equipment (e.g., improved scheduled maintenance on test stands) solutions. The Engineering Notes contain a number of suggestions.

The process-related matter that seems to stand out most clearly is the variability in method among operators. (Variability of method probably occurs among craftsmen as well, but our focus was the test environment). Examples of this variability include, but are probably not limited to, time to "plumb" a control for testing, number of repetitions of tests, amount of time on some tests, interpretation of test data, interpretation of test stand and fuel control interactions, and selection of procedural information to follow. Variability should be avoided where possible because it makes the process difficult to understand and therefore difficult to improve, it affects quality, it makes production levels difficult to predict, and it creates unexpected performance differences among people.

Recommendation for Further Study or Intervention

Brief Description

The variability matter discussed in Processes above is an excellent target for further study because low-cost changes in information presentation have a good chance of reducing variability. An intervention approach applying to test stand operators that could address the variability matter described above would standardize the information available to operators.

Briefly, this idea calls for a computerized data base containing diagnostic and adjustment (corrective information) information. We

097004

envision a low-cost, PC-based, evolutionary build-up of troubleshooting logic trees that supply the requesting operator an aid in fault isolation. Operators would be rewarded for making useful additions to the data base.

Rationale

The following facts suggest an intervention aimed at reducing variability in methods by improving and standardizing technical information for operators.

1. A key source of information for operators during fuel control testing is test stand output (computer screen). On-site maintenance, particularly David Bippert, has developed very comprehensive and powerful diagnostic programs out of software originally designed for quality control of newly produced UFCs. But for various reasons, such as departure from the software's original purpose, it does not meet every procedural or diagnostic need and operators typically do not rely exclusively on test stand diagnostics.

2. Technical Order (TO) information (upon which test stand diagnostics and output is based) is a second source of information for operators. However, many paragraphs are out of date and/or inaccurate. The TO is oriented to overhaul rather than test and repair, and some necessary test procedures are not contained in the TO. Surprisingly, while textual/diagrammatic fault isolation trees are virtually an industry standard format for mechanical procedural information, we could not find any of these trees in the TO.

3. Expert advice from an on-condition maintenance (OCM) team is a third source of information. The OCM team consults on problems and distributes tips, solutions, and advisories on paper to operators. Frank Mann, before becoming OCM Team Leader, started a trial system whereby operators in his unit would write their diagnostic and adjustment procedures on sheets of paper and turn them in to him. Mann's intent was to sort through the written sequences and determine the most effective troubleshooting sequences for specific problems. Mann told us that his system was popular in his unit because it increased the amount of shared information about specific problems.

097005

He was promoted before collecting enough of the forms to derive optimal sequences.

4. A fourth source of information used in fault isolation is knowledge shared among operators themselves. This sharing is effective when it is available, but no formal means exist to build on it. Mann's experience indicates that operators would probably share tips, discoveries, and useful experiences more often if a medium existed to do so, particularly if some incentive (reward) were associated with the sharing.

5. Training information is a fifth source of information, although we were not able to study this material.

6. The variety of sources adds to the variability in method among operators, but the fact that information comes from multiple sources should be respected. Attempts to combine, supercede, or abolish some forms of information would be very time-consuming and counterproductive.

More on the rationale for this approach is contained in the Engineering Notes of August 15, pp 5-8.

Detailed Description of Intervention or Study Plan

This intervention calls for setting up in the shop area a single 386- or 486-level ruggedized personal computer with high-capacity hard drive. The computer would run a data base program with simple graphics to produce fault isolation trees and a simple menu for operator interface.

To use the computer, operators would walk from their stands to a central location, use a menu to select a test paragraph, and request a printed copy of a logic tree containing the test and fault isolation sequences for the paragraph. (Please see attachments for sample screens.) They would return to their stands with the printed copy.

Logic tree sequences would contain usually three alternative procedures in a suggested sequence:

- o Test stand procedure is shown in standard fault-tree format (first alternative)
- o TO procedure is also shown in standard fault-tree format (second

097006

- o would present the current variety of information sources in a unified format in one location.
- o would present procedural information in a visual, easy-to-follow format, using standard icons of diamonds for decisions and rectangles for procedures.
- o would lead operators to follow standardized procedures but ...
- o would give the test stand operator the same freedom as they have now to exercise independent thinking and gather information for their individual benefit.
- o would relieve the OCM team from repeated calls for the same specialized information.

A precedent for computerized information like the type being recommended here exists in a system for parts inspection at Douglas Aircraft in Long beach, California. Implementation began with a single computer in the inspection area and training for a few respected inspectors. Their use of the system and casual discussion of the system with other inspectors helped generate interest throughout the inspection area in using the system. In time the computerized procedures became the preferred method and more computers were installed.

Rewards for suggestions from operators (their notes on test and fault isolation experience) might be monetary (Form 1000), the name of the contributing operator displayed on a chart or on the printout so it can be seen by others, preferred parking location for a month, thanks from management and supervision in meetings, and so on.

Prototype menu screens and screens with logic trees are attached (6 pages). All of these pages present models of actual screen (and MCR paper) output, although only the first two pages are shown with borders. The prototypes deal with Mating and Indexing Paragraph 12.000, Idle Governor. Subparagraphs 12.090, 12.110, 12.130, 12.140 and 12.180 are shown in prototype. Note that alternative sequences are called out, giving a choice to the operator, but leading to consistency among operators by their cascading order of display. The alternatives (test stand instructions, TO, OCM recommended approach, etc.) should be arranged represent the facility's usual priority

097007

M & I Fault Solution Computer

Enter Test Sequence Paragraph
Number _____

Press Enter to Continue

Menu Screen #1

12.000 Idle Governor

Select a specific Paragraph
Number:

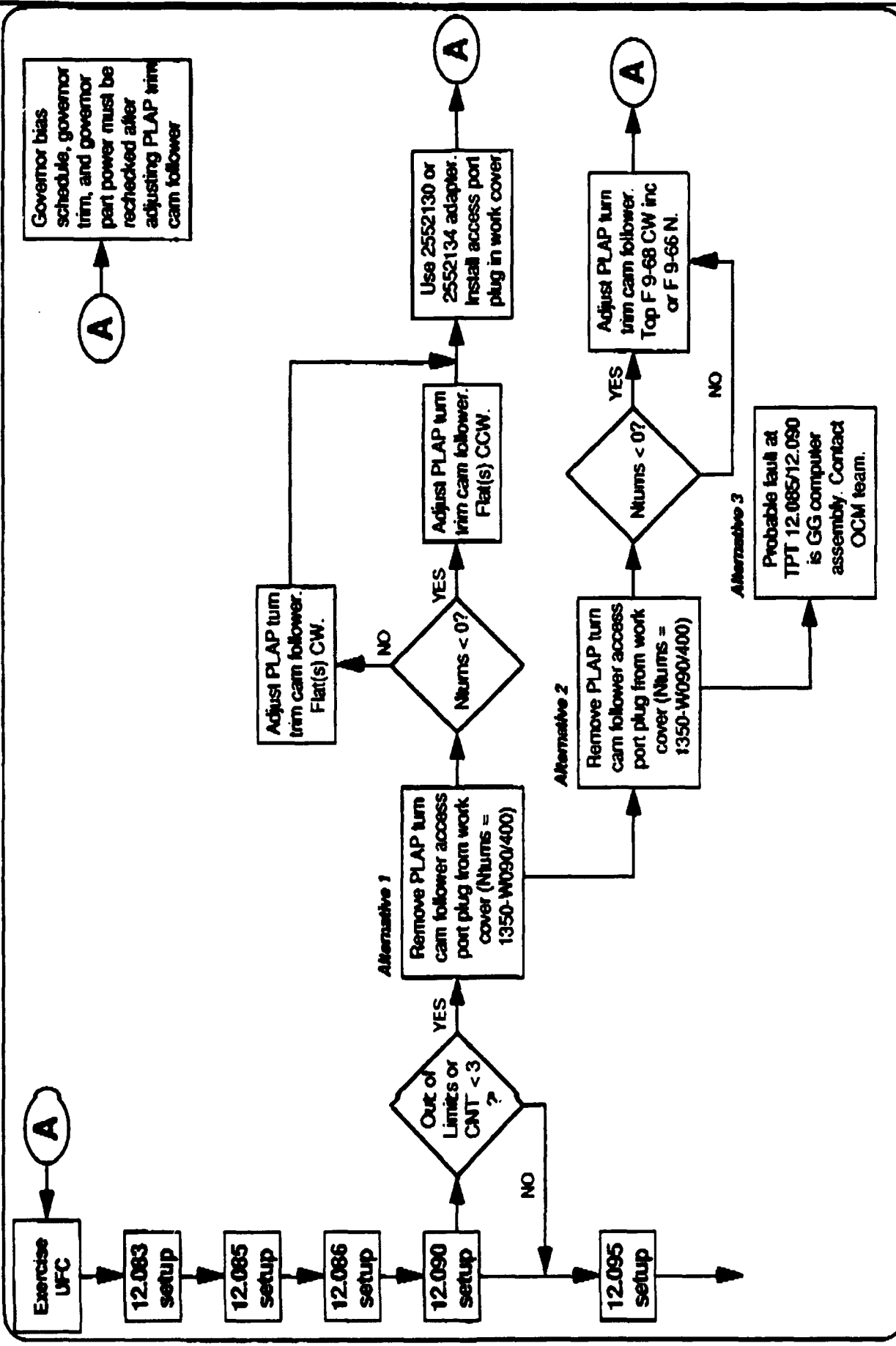
- ___ 12.090
- ___ 12.110
- ___ 12.130
- ___ 12.140
- ___ 12.160
- ___ 12.180

Place an "X" on Line and Press Enter to Continue

Menu Screen #2

(Optional; Will not
appear if entire
test sequence
number is entered
in Menu #1)

097008

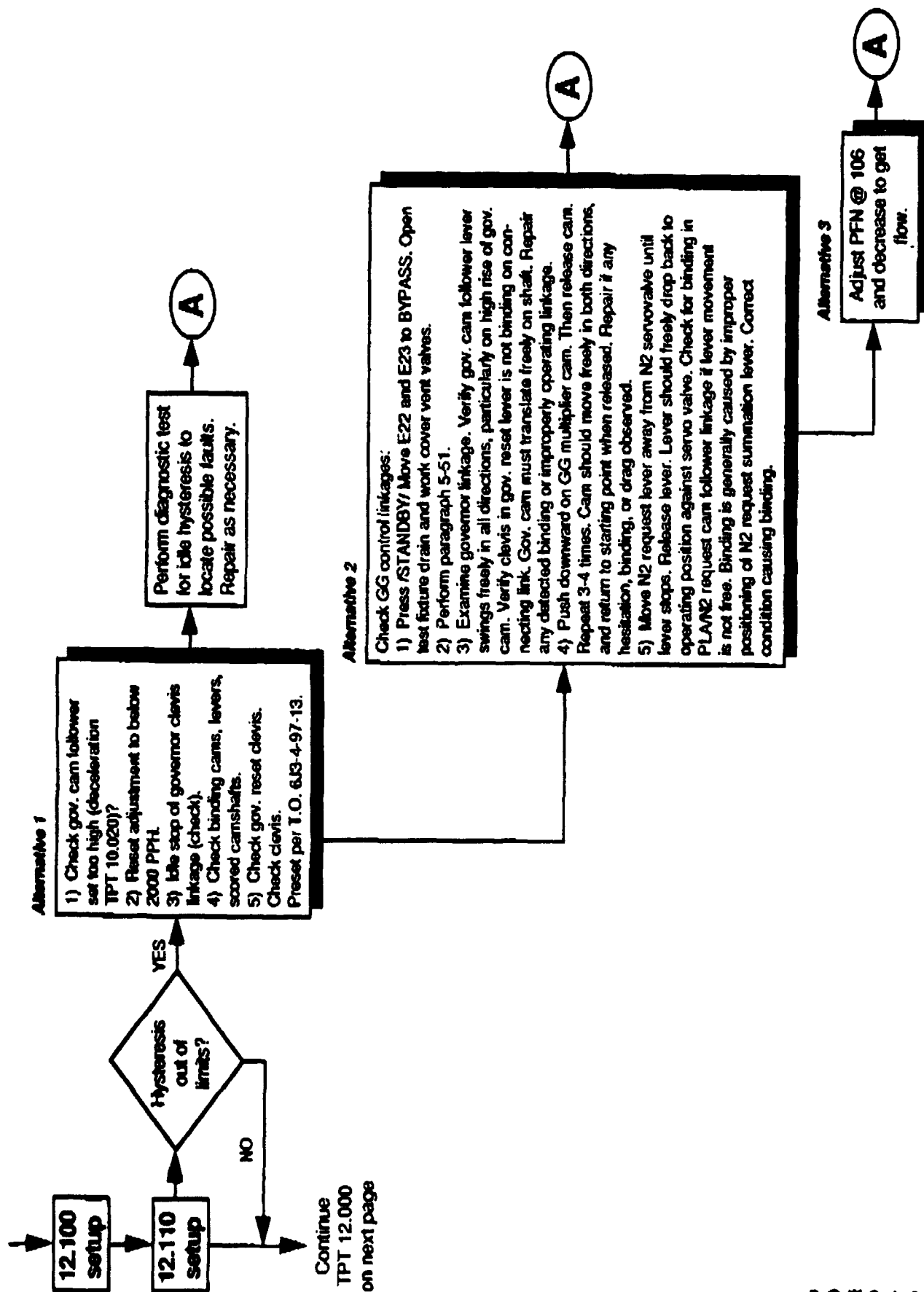


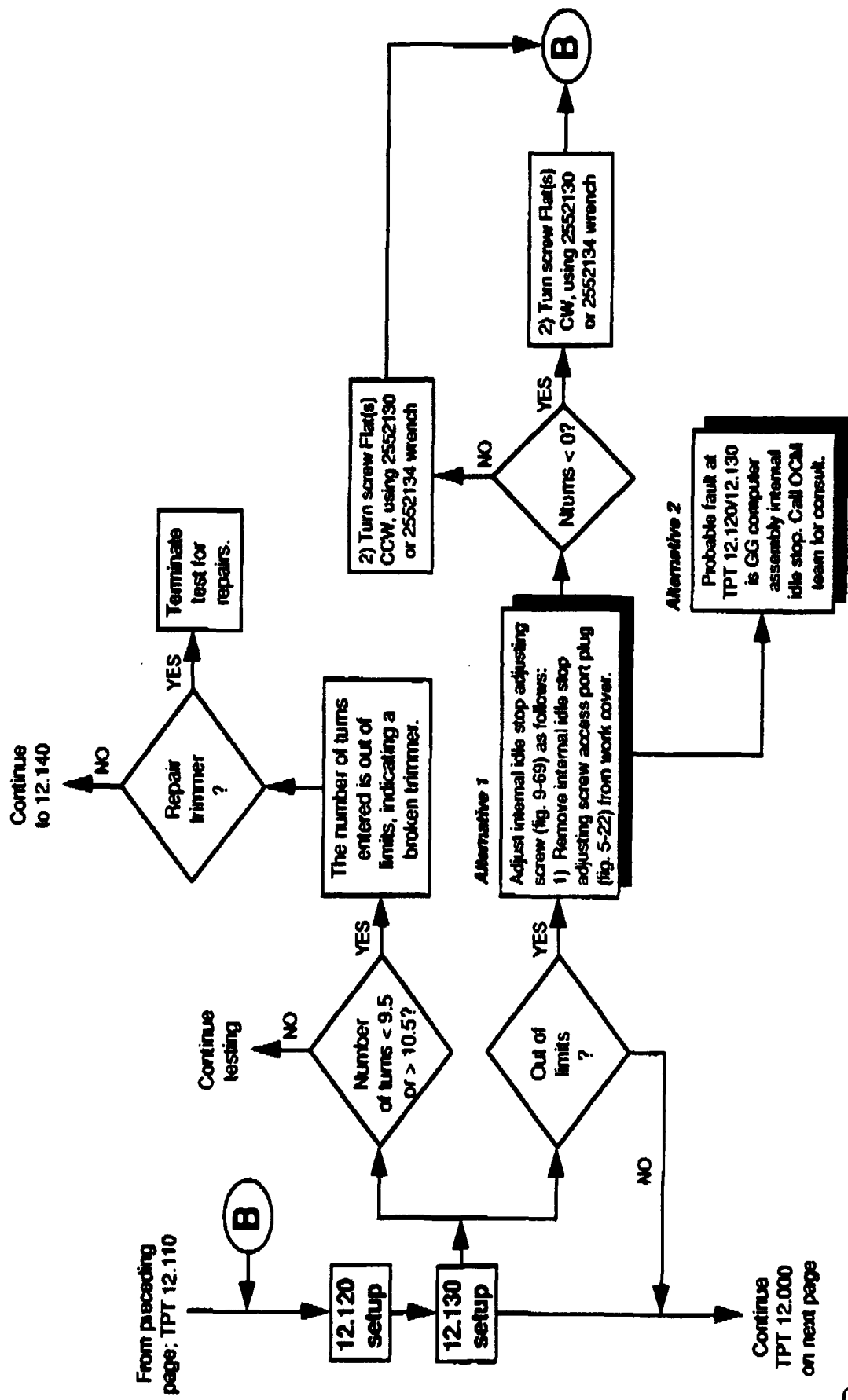
Place "X" on Line Next to Desired Option and Enter:
 Next Page___ Previous Page___ Print this Page___ Print all Pages___ Return to Main Menu

097009

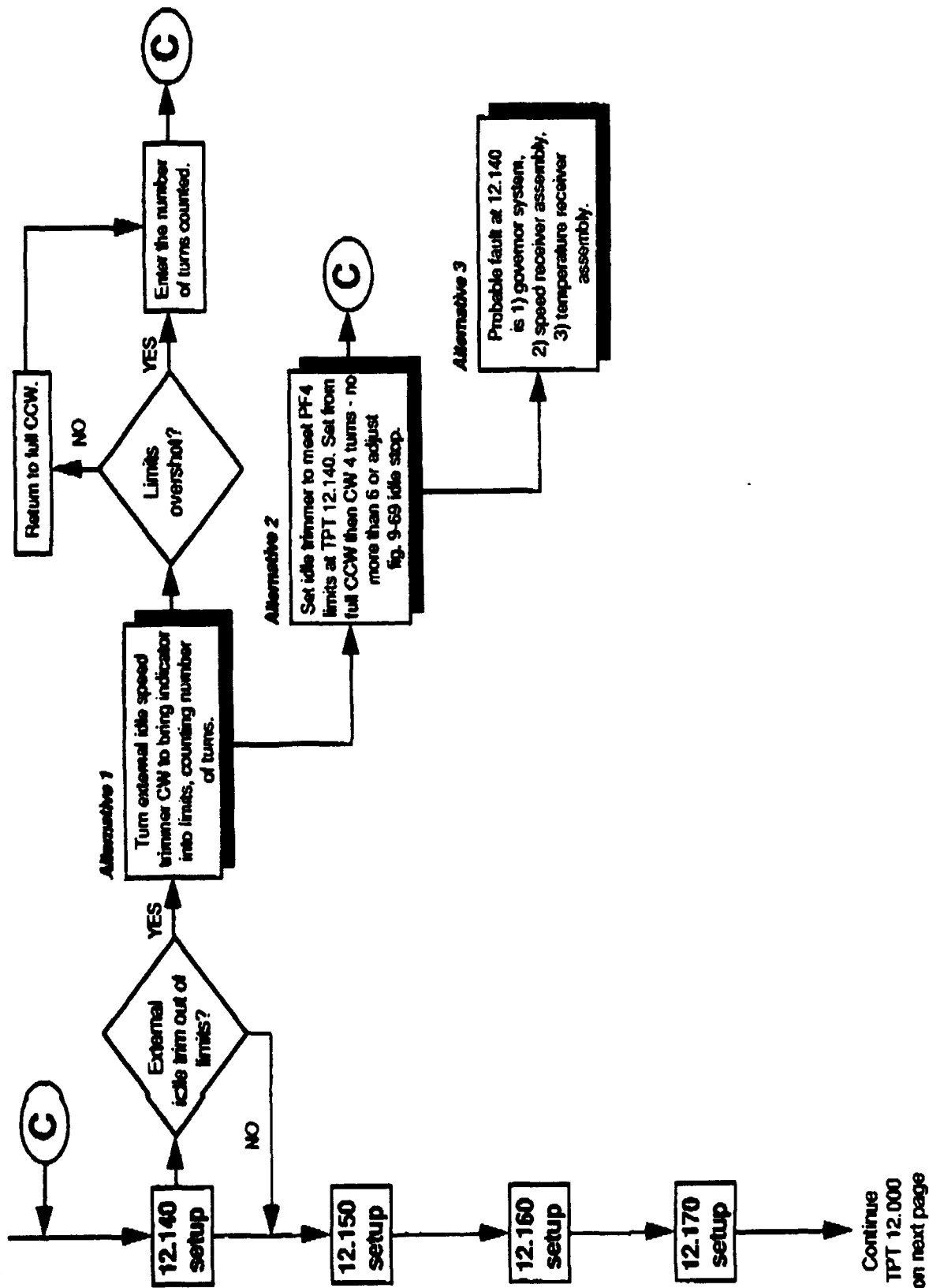
SEP 19 96 12:30

010260



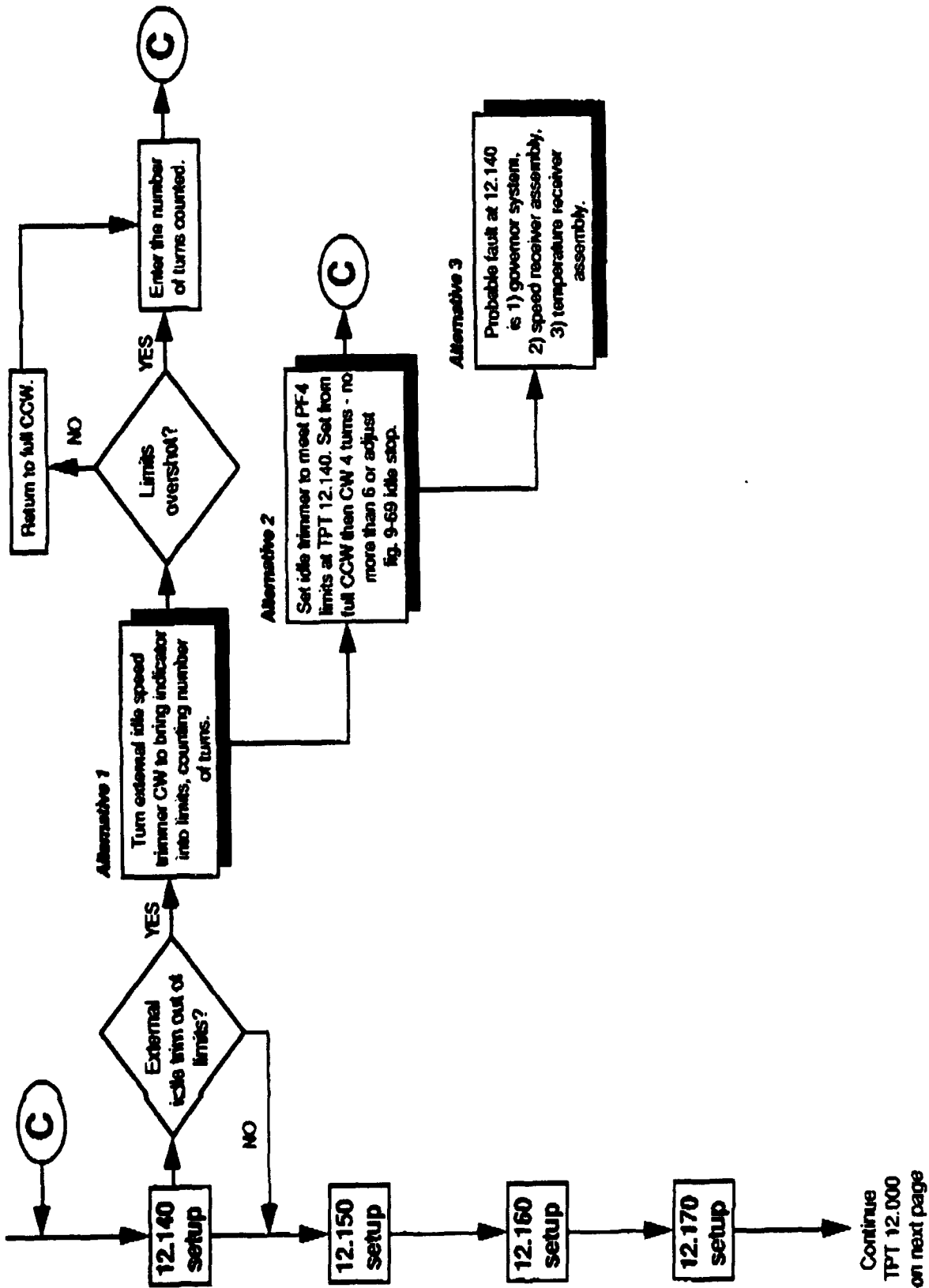


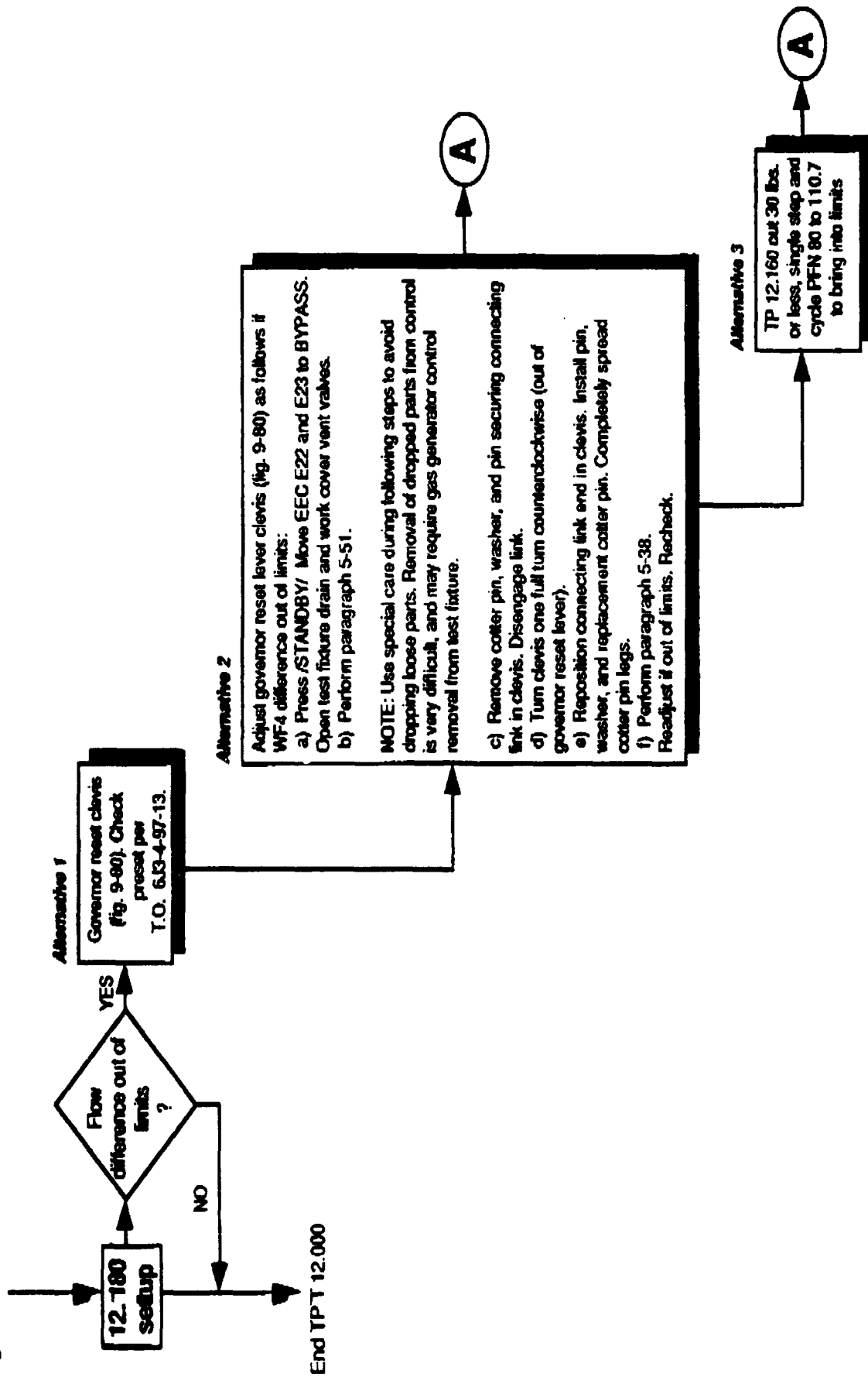
From preceding
page: TPT 12.130



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From preceding
page: TPT 12.130





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ranking for particular tests.

Implementation Plan

We suggest the following sequence for implementing this method.

1. Present idea to customers. Obtain approvals.
2. Determine requirements for computer in UFC shop.
3. Locate computer and printer and purchase.
4. Design database and graphics interface with user-friendly input and output screens as suggested by this Human Factors analysis.
5. Gather information regarding M & I test sequences (if M & I is selected as the system trial). This information will be located in test stand output, TOs, OCM team information, training information, operators' personal and shared knowledge.
6. Hire/transfer a programmer into the project.
7. Program database with information for some non-trivial number of paragraphs and input/output formats.
8. Select a few operators on each shift to be part of a pilot group to use the new system and attempt to increase other operators' awareness and acceptance of the new system.
9. Selected operators use system, employing computer as they encounter controls that defy quick diagnosis.
10. Programmer adds to database as trial period proceeds and uses notes and suggestions from operators' NCR copies.
11. Reward operators' additions to system.
12. System is expanded according to shop needs.

097014

alternative)

- o Shop experience/OCM recommendation is also shown in standard fault-tree format (third alternative)

The personal computer printout would be on "no-carbon-required" (NCR) paper so that operators could write notes about the test paragraph and their actual experience with the specific test, keep their original in a notebook and, if they chose to, pass the copy (containing their hand-written notes about the paragraph) on to the OCM team.

If the OCM team considered suggestions in the notes to be important additions to the fault tree for particular test sequences, additions to the data base would be made and the operator submitting the notes would be rewarded in some way. This method would bring about the steady growth of shared information among operators.

The data base would contain all the various sources of information described above in Rationale for selected paragraphs. Existing fault isolation procedures from all current sources would be easily accessed with a powerful personal computer and presented in logic tree format.

Our analysis of the shop processes indicates that while the lack of a standardized system of information has made UFC fault diagnosis complicated, the current methods are still effective, although not efficient. All the data gathered by an operator is necessary to complete the task. The proposed method ...

- o would not change the information in any way.
- o would not alter procedures.
- o would not replace existing directives or supplant training material.
- o would not provide diagnoses. It is not an expert system.
- o would not require adding all paragraphs before implementation of the system. A few critical paragraphs can be selected to start the system, and additions and updating could continue after the system is introduced.

The data base would contain information that is available now, and ...

M & I Fault Solution Computer

Enter Test Sequence Paragraph
Number_____

Press Enter to Continue

Menu Screen #1

12.000 Idle Governor

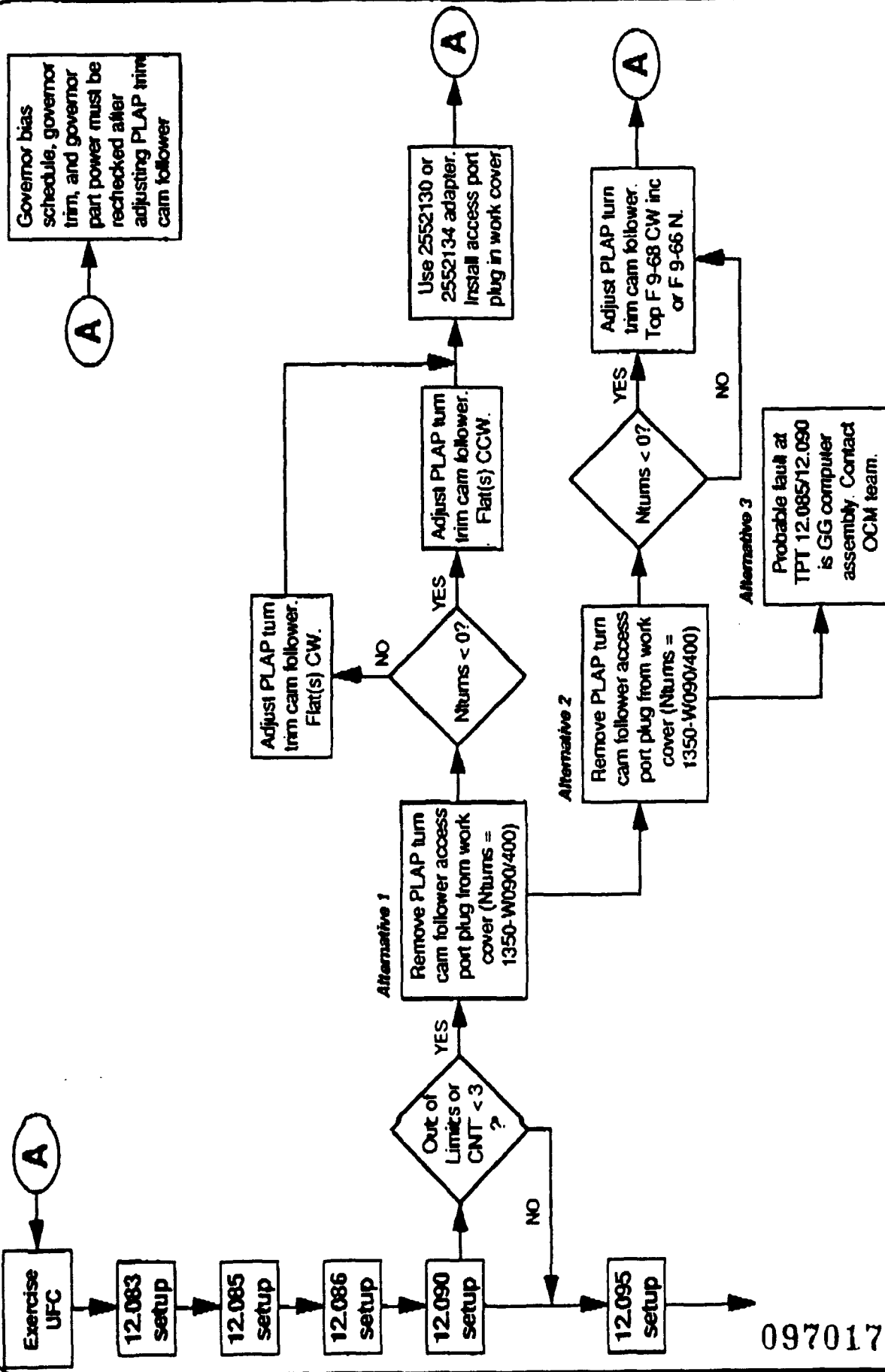
Select a specific Paragraph
Number:

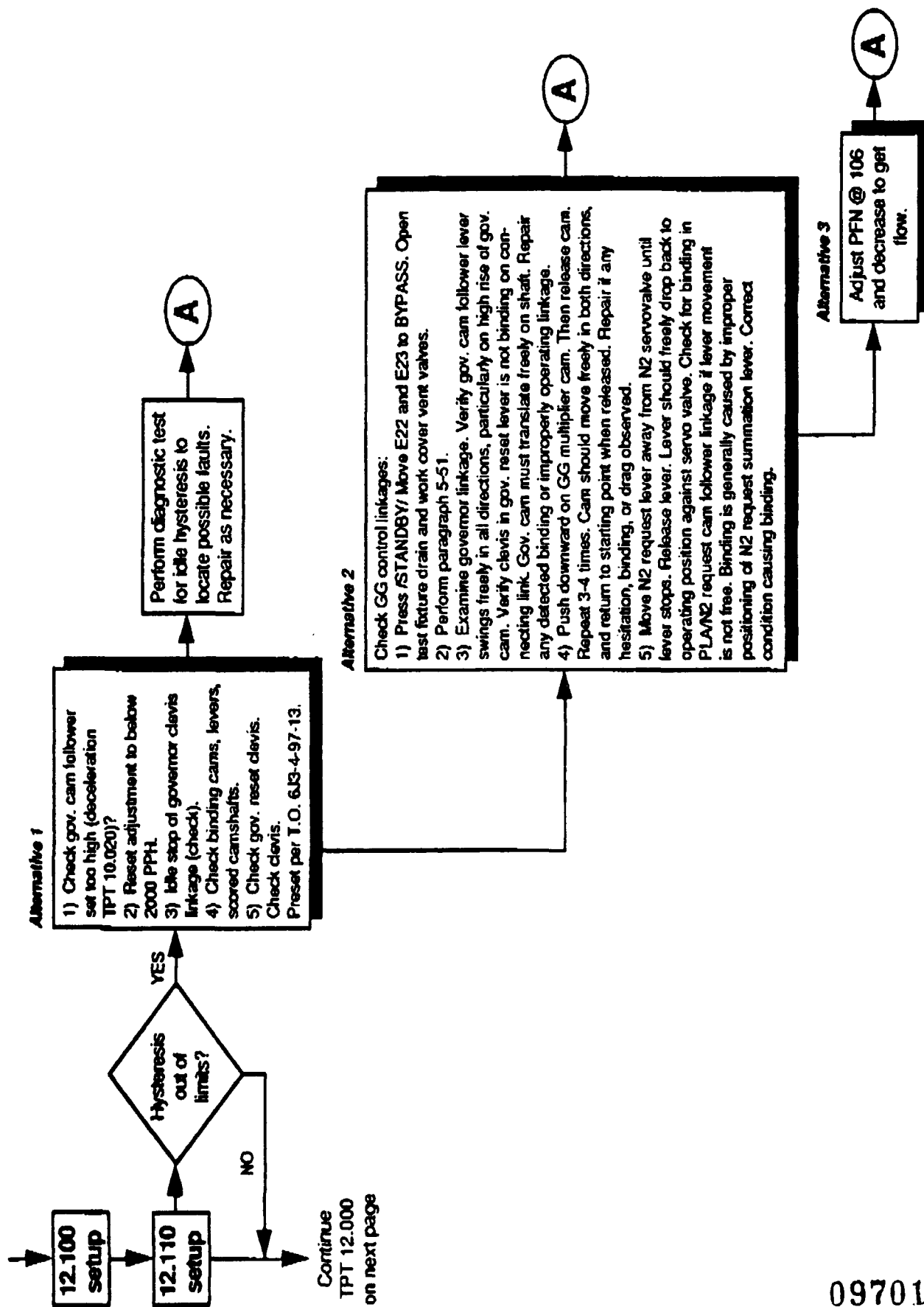
- ___ 12.090
- ___ 12.110
- ___ 12.130
- ___ 12.140
- ___ 12.160
- ___ 12.180

Place an "X" on Line and Press Enter to Continue

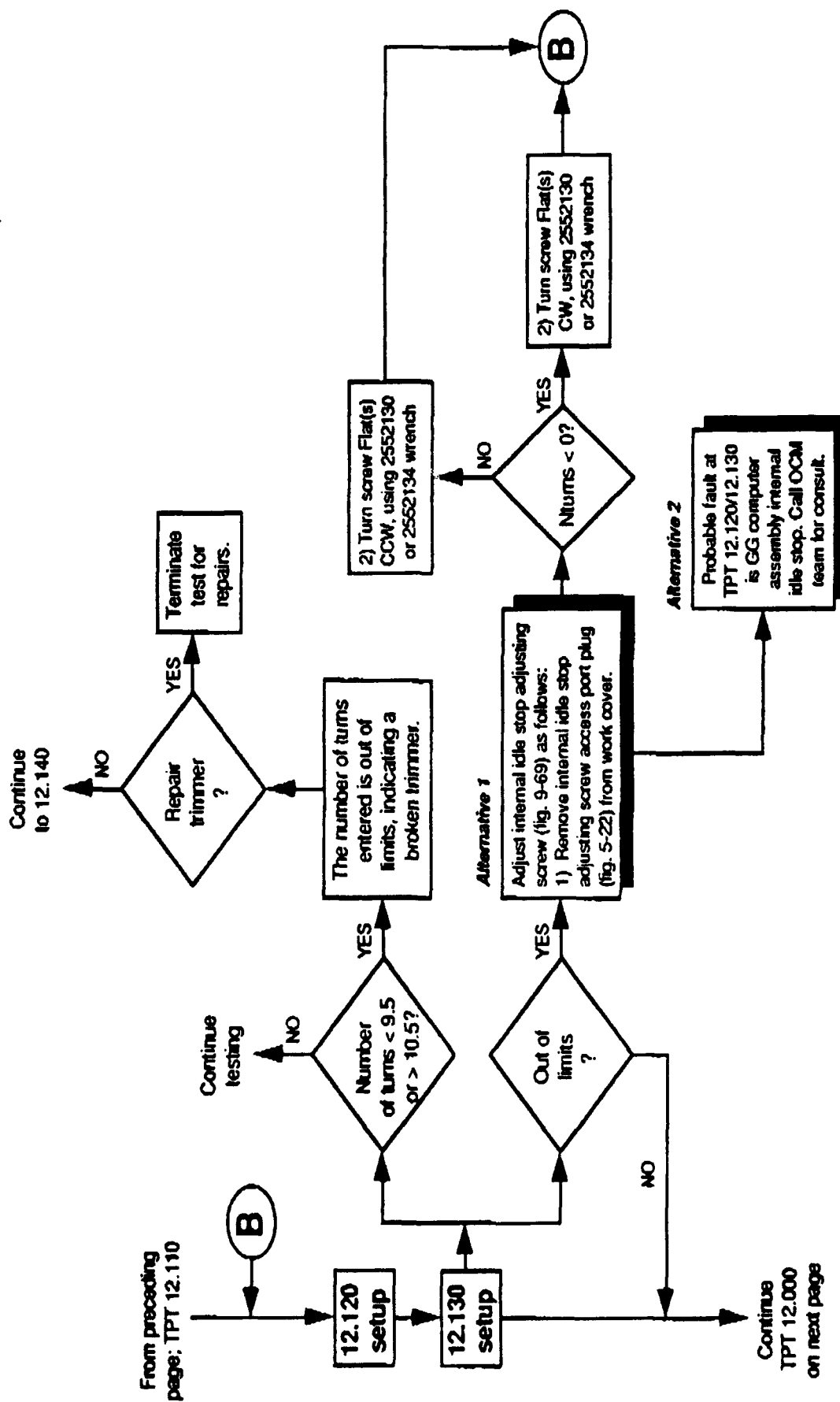
Menu Screen #2

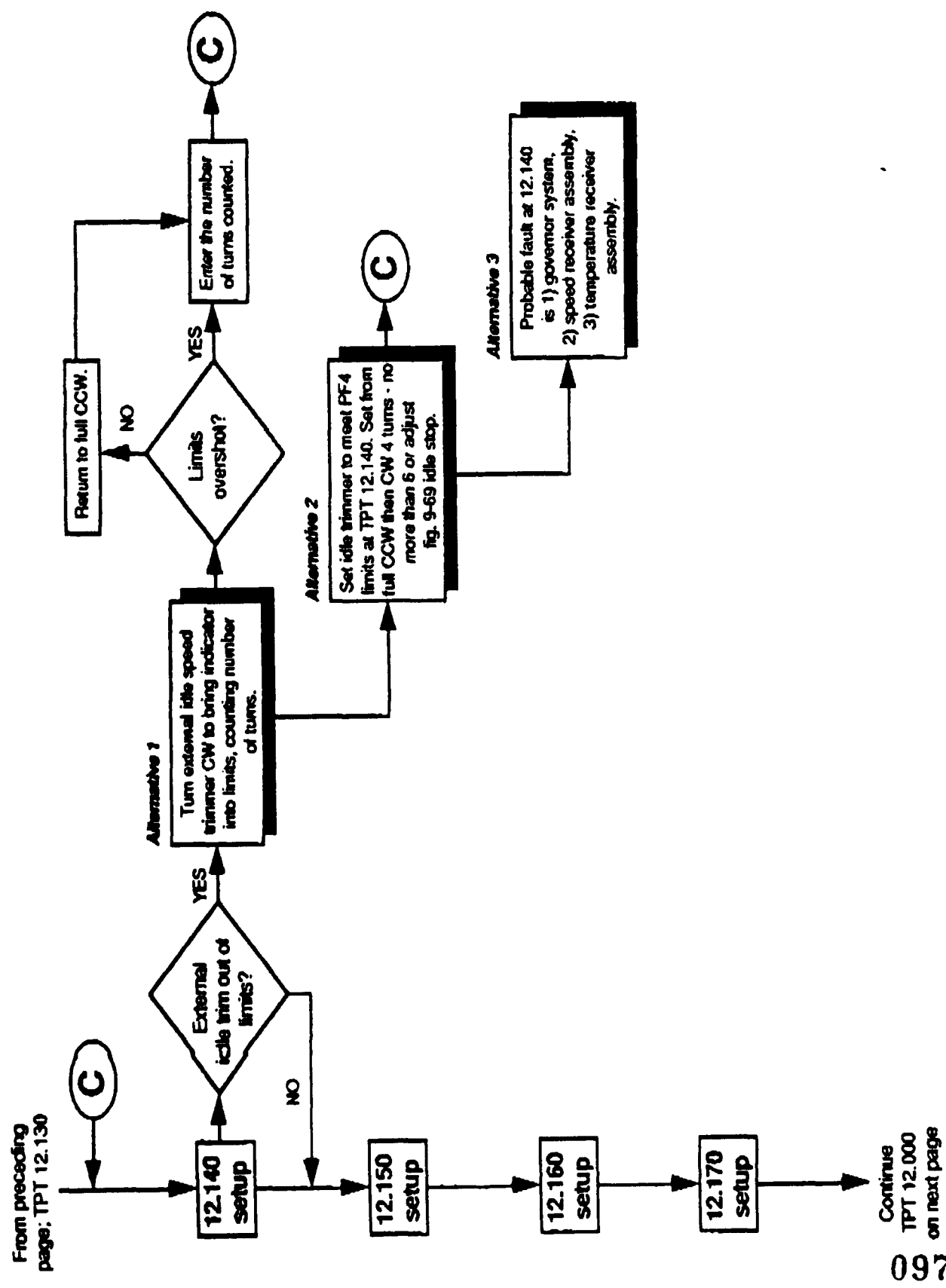
(Optional: Will not
appear if entire
test sequence
number is entered
in Menu #1)



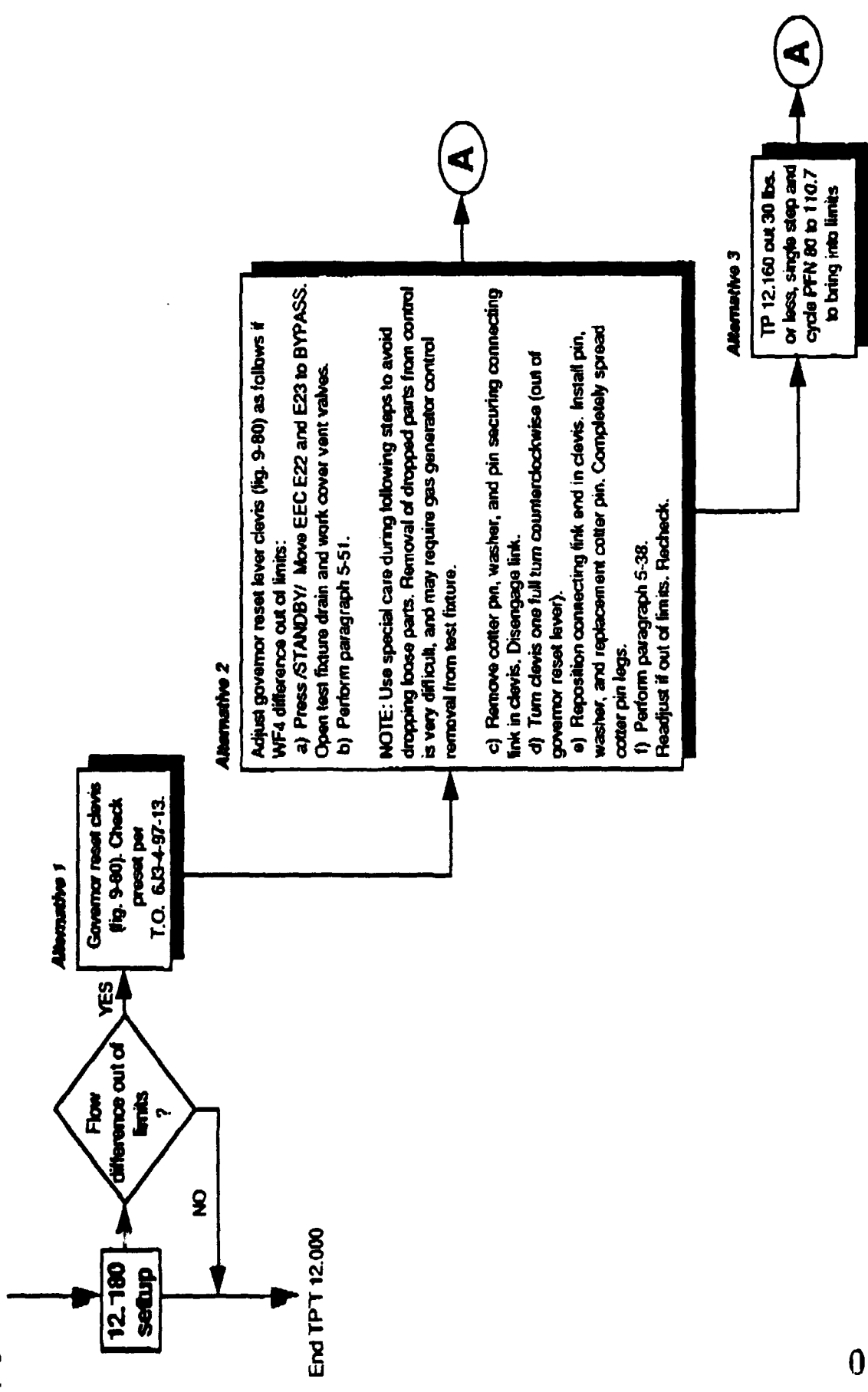


097018





From preceding
page: TPT 12.170



097021

10.0

MEETINGS & GENERAL INFORMATION

IPI MEETING ATTENDEES

10 JULY 1990

<u>NAME</u>	<u>OFFICE</u>	<u>PHONE</u>
Greg Gardner	MDMSC	5-7630
Pete Garza	MAWFT	5-7491
Merrilynne Henderson	MATEC	5-8678
Susan Schattle	MAWFT	5-7491
Glenn Bush	MMFBA	5-6224
Ralph Alvarez	MAEEN	5-7716
John Smith	MAEEN	5-7716
Scott Vroman	MDMSC	5-7630
Phil Parker	MDMSC	5-7630
Ken Premo	MDMSC	5-7630
Antonio F. Perez	MATPFA	5-4491
Frank A. Mann	MATPF	5-4491
Sadie McFarland	MDMSC	5-7630
Jerry Klar	MATE	5-6235
Frank Schutter	MATES	5-4702
Joe Montano	MCAIR	5-7630

100001

ENGINEERING NOTES

EMPLOYEE _____ DATE _____ PAGE NO. _____
RCC _____ SUBJECT _____

27 July Pre-Validation MTG

<u>NAME</u>	<u>ORG</u>	<u>Phone</u>
Robert WOSTEK	MDMSC	58678
Susan Schattle	MATEC	57491
Chris Vasquez	HAWFT	7696
JIM GROUNDS	MATP	5114
Greg Gardner	MAIAP	7630
Scott Hansen	MDMSC	7630
Paul Nadeau	DSSDET	4530
Adan Sisa	MATPF	4491
Also Bill Golder	MDMSC	

ENGINEERING NOTES

135

EMPLOYEE P. Parker DATE 7/3/90 PAGE NO. 6
RCC MAT PFA SUBJECT IPI meeting

7/3/90 - Tuesday

Ken Premo and I obtained a magnetic tape containing GO-19-C data, which should be useful in tracking the MTTR and MTBF. We took this tape to Susan Randolph, who will load it into her VAX. Susan has agreed to format this data, which is in a raw state. Her format will include the machine identifier, date and time of failure, the cause of failure, the labor cost associated with the repair, and the down time. Ms. Randolph was also kind enough to volunteer to set up the files to calculate and report the MTTR and MTBF in any printouts we should need. I made arrangements to contact Susan Thursday morning.

This afternoon we had our first IPI weekly meeting, which will always be scheduled to begin at 1:00 PM Tuesday afternoons. The list of attendance was as follows:

<u>Name</u>	<u>Organization</u>	<u>ext.</u>
Susan Schattle	MAWFT	57491
Merrilynne Henderson	MATEC	58678
Frank Schutter	MATES	54702
Greg Gardner	MDMSC	57630
Robert Wojtec	MATEC	58678
Cpt. Paul Nadea	DSSDLT	56580
Randy Harris	MDMSC	57630
Ken Premo	MDMSC	57630
Sadie McFarland	MDMSC	57630
Tim Morrison	MATES	58521
*John Smith	MAEEN	57716
Adan Sosa	MATPFA	54491
Antonio F. Perez	MATPFA	54491
John R. Laymon	MATPG	58831
Chris Vasquez	MATP	57696

DDB SECTION CODE 10.0 DDB PAGE NO. _____

100003

ENGINEERING NOTES

136

EMPLOYEE Phil Parker DATE 2/3/90 PAGE NO. 7
RCC MATPFA SUBJECT IFE meeting

Dan Gonzales	MATEA	54667
Cpt. Glenn Bush	MMFBA	56224
Phil Parker	MDMSC	57630
Ron Lee	MDMSC	57630

The meeting began with introductions of all MDMSC personnel involved with the various task orders. The goals and objectives of the program were discussed. The initial briefing included the following:

- mention of the fact that we are significantly ahead of schedule in the UFC area. (Initial Model run results are expected by Monday morning).

- necessity of specific models to identify the unique problems of the various RCCs.

- discussion of the "Tracker II" ideas jointly being worked by Ms. Henderson and Mr. Gardner. Mention that these type of in-house systems will be very useful in feeding DMMIS.

- discussion of both the initial observations and the goals involving UFC test stands.

- initial observations of the cleaning line were discussed. Mention of the possible use of Taguchi loss functions in this area, as well as possible changes in fixturing and tank agitation procedures. Slurry technology and cryoblast were discussed.

- mention of the specialists (engines, human factors, test stands, etc.) to be brought in as task order consultants.

DOB SECTION CODE 10.0 DOB PAGE NO. _____

100004

ENGINEERING NOTES

137

EMPLOYEE P Parker DATE 7/3/90 PAGE NO. 8
RCC MATPFA SUBJECT IPI meeting

- the "over-the-shoulder" training agreement was discussed,
with some explanation of what this would entail.

DDB SECTION CODE 10.0 DDB PAGE NO. _____

100005

ENGINEERING NOTES

EMPLOYEE GARDNERDATE 5 July 90PAGE NO. 1RCC TO -16SUBJECT DMMIS / UDOS Interface

Met with Mr Morris Wexler to discuss the DMMIS Program and how it will relate to IPI/UDOS 2.0. Mr Wexler described the structure of DMMIS and offered to provide excerpts from the data element specifications as they are currently defined.

DMMIS is an MRP II system coupled to a set of integrating protocols designed to link it to several existing systems. It will replace about 30 existing data bases. Final implementation at SA-ALL is about 2 years away. Total DMMIS budget is \approx \$250 million.

DMMIS is not a simulation tool. Mr Wexler did not feel that the IPI process was duplicating any DMMIS products. He did feel that many of the data elements input/output by UDOS 2.0 were common to DMMIS and that some overlap of effort existed. We both agreed that it would be highly desirable to explore interfacing UDOS and DMMIS in the future (when DMMIS was better defined)

Many of the data elements required by DMMIS + UDOS are ~~do~~ not currently available in any data base. The MDMSC IPI is collecting these elements by building data bases from paper (Test logs, Tracker outputs, etc) and uncollected electronic files. Mr Wexler agreed that this work (expensive/labor intensive) would have to be performed by Gov't personnel prior to DMMIS implementation. He felt that, where it were cost effective, it would be an excellent idea for UFC personnel to maintain/update these data bases after the IPI MDMSC team has finished TO 16. This effort would include data collected by TRACKER and the Test log data.

DDB SECTION CODE 10.0

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100006

ENGINEERING NOTES

EMPLOYEE GardnerDATE 5 July 90PAGE NO. 2RCC UFC TO-16SUBJECT Dnm15/ums Interface

I feel that by collecting the momsc cost for developing these databases and translating into estimated Govt costs (momsc Labor hours x Govt hourly rate = est. Govt cost) a cost benefit analysis can be made comparing the cost of maintaining the databases vs. recreating them in 1-1.5 years. If this CBA indicates a positive cash flow, it should be documented as a quick fix.

DDB SECTION CODE 10.0

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ENGINEERING NOTES

EMPLOYEE Parker DATE 7/5/90 PAGE NO. 9
RCC MATPFA SUBJECT General Info

7/5/90 - Thursday

I am somewhat concerned about the perceptions of several of the ALC personnel regarding the IPI data characterization methodology which we are presently using. In recent conversations with these personnel, I have heard concern expressed about the time required to construct the data files, as well as the appropriateness of the basic methods of data collection being used. Several conversations with Ms. Henderson have led me to believe that she is somewhat frustrated with the manner in which we approach the construction of the model files. Part of this has come about through miscommunication. Constructing the resource and operation files for a simulation model in the absence of the needed historical documentation is difficult and time consuming, and this has by necessity constrained some of our desired customer communication and training time. I do not mention this in way of an excuse, but rather as a documentation of situations to avoid in all future tasks associated with this project. In my experience with this program, effective communication is absolutely essential if all goals and objectives are to be met in a timely manner.

Another source of concern for Ms. Henderson, as well as certain other ALC personnel, is the fact that it appears that we are often times reproducing work which they have already performed. Ms. Henderson is an extremely efficient and productive engineer, and it is no surprise that this would be offensive to her, if it were indeed the case. Naturally, we also desire to make the most efficient use of our time. However, we are constrained to construct our data files in a format which can be utilized by the UDOS model, as well as to sift through the data we are provided or personally collect in order to determine its degree of accuracy. This may seem obvious, but again, we have not always effectively communicated

DDB SECTION CODE 10.0

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100008

ENGINEERING NOTES

EMPLOYEE P. Parke DATE 7/5/90 PAGE NO. 10
RCC NATPFA SUBJECT General info

our specific needs or constraints to our ALC counterparts. For example, Ms. Henderson mentioned to me earlier this week that she wasn't previously aware that we already had a simulation model per se to be applied to the UFC repair process. While this may seem somewhat amusing, it really isn't. Again, it basically shows that we need to spend more time in communicating with our customer. This is especially important this year, as we have committed to the goal of informal training on our processes, as well as the obvious objective of transferring this technology to its end user. I know from conversations with Mr. Gardner that this is one of his most vital concerns, and that he is in the process of developing a working "team concept" plan for involved ALC and MDMSC personnel.

Another area of concern to me is the level of detail to be modeled in our initial simulation run. I am of the firm opinion that it is much more reasonable for the model to be constructed in phases, with an initial "broad base" format, and subsequent detailed data added where needed to represent actual floor processes. I cannot overstress the importance of this approach. It is much more cost effective to build a functioning model at a higher level of order than to build a model with superfluous data or unneeded detail. Such detail can be a source of error, and can degrade the robustness of the model design. When detailed operation or resource descriptions are necessary, they can be added in to the basic model format, which can serve as something of a "superstructure" on which to build. In reference to these points, please see the following attachments, which represent a part of Mr. Scott Vroman's engineering notes for the week of 7/2/90. These follow under the designator "E".

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100009

EMPLOYEE GARDNERDATE 30 July 90PAGE NO. 1RCC MATPFASUBJECT Production Input To Process

During our flowtime meeting, Mr Perez & Mr Saxe expressed disappointment with the coverage of production in our engineering notes (I had given them copies to review/comment on). They felt that production was inadequately covered and poorly served by the notes. I explained that the negative image was caused by our focus on problem areas (as sources of potential improvement) and not because we wanted to present a negative image of production. We have already gotten a great deal of information from production and included it in our notes. Most of this information was operations data for the model and is not always obvious as production input.

To insure adequate production input into our process, I have taken two steps:

- ① I have asked production to provide feedback on our notes. I will include this feedback as part of our engineering notes when submitted as a deliverable (Both on the monthly status rpt & in the PDB). This is the same arrangement I had previously made with MATEC (Merrilynn Henderson) and MAWFT (Susan Schalle).
- ② I have asked Mr Perez to review the production data included in our current model version, and make changes as required. This data is from a variety of sources (TRACKER, production interviews, Equip. Logs, etc) and should be reviewed by production management. The changes made by Mr Perez are

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DDB PAGE NO. _____

100010

EMPLOYEE GARDNERDATE 30 July 90PAGE NO. 2RCC MATPFASUBJECT Production Input to Process

shown on the attached sheet. The overall effect of these changes has been to lower the average flow times and reduce utilization of WG-11 craftsmen.

Merrilyne Henderson has given us the AWP data which she had originally obtained from scheduling. This data appears to be a reasonable sample of AWP occurrence and duration and should be adequate for modeling.

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DDB PAGE NO.

100011

DDB PAGE NO.

Q.	M/L	W/S	W/L	W/S	W/L
1	2	1/3	12	4	1/4
2	1	1/12	12	20	11
3	6	1/24	36	11	11
4	6	1/21	12	40	11
5	16	1/12	36	16	11
6	15	3/4	57	11	11
7	11	5/3	14	7	1
8	13	3/2	17	1	1
9	2	5	16	11	11
10	6	24	1040	11	11
11	7	2	2.5	11	11
12	4	7	12	11	11
13	2	2.5	7	4	11
14	1	3.6	6	4	11
15	1	3.1	6	4	11
16	2.5	3.6	4	11	11

ENGINEERING NOTES

EMPLOYEE _____ DATE _____ PAGE NO. _____

RCC _____ SUBJECT _____

IPI MEETING
ATTENDANCE3/21/12
1200

<u>Name</u>	<u>Org</u>	<u>Ext</u>
SUSAN SCHATTRE	MIAWFT	5749
Merilynne Henderson	MATEC	58678
FRANK SCHUTTER	MATES	5-4702
Greg Gardner	MDMSC	5-7630
Robert Wojtek	MATEC	58678
Paul Nodca	OSSDLT	56580
RANDY LARSEN	MDMSC	57630
KEN PREMIO	MDMSC	57630
SANDIE McFARLAND	MDHISC	57630
John Smith	MFEES	58521
Tim Morrison	MATES	58521
ADAM SISA	MATPF	54491
Antonio F Perez	MATPFA	5-4491
JOHN R. LAYMON	MATPG	5-8831
CHRIS VASQUEZ	MATP	7696
DAN GONZALES	MATEA	5-4667
GLENN BUSH	MIAWFT	56580

←
copies of
5 notes

Technology Insertion -->

Industrial Process Improvement

McDonnell Douglas

Industrial Engineers (3)

Mechanical Engineer

Computer Scientist

Part Time Help

SA-ALC Site Manager (IE)

Three studies over six months.

What is the IPI Agenda?

Ask Questions

Learn how we fix UFCs

Production

Planning

Scheduling

Engineering

See how all the players work
together to get the job done.

Build A Process Model

Computer Program (UDOS)

Collect Data

Describe the flow

Determine Occurrence Factors

Duration Distributions

For Each Operation

(High, Low, & Avg)

Validate The Model

Validated when all users
agree it works and the output
reflects what is really happening.

Waiting lines

Sales/Production

Utilization

Equipment

People

Experimentation

Find computerized answers to
theoretical questions, draw con-
clusions, and make recommendations.

More people??

of UFCs produced
amount of waiting time

Which type of people??

50002 T/S Operators?

Gas Generator Mechanics?

How many of each type?

Run the Model

Change baseline conditions

Computer "simulates" five quarters

Output Summarization Printed

Evaluate Worth of Idea/Experiment

Find Optimal Arrangement

Engineering Assessment

Separate from the model

Process Improvement

Find a better way

Test Stand interruptions

Large amount of Work In Process

Critical Path - Key Operations

Tailored WCDs & Menu Pricing

UFC Tracker II

Tech Order Aids - Work Specs

What is the point?

The IPI Team is:

- * working with our people.
- * experienced in the field.
- * looking for further opportunities.

The IPI Team is here to help us improve.